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RECORD OF DECISION

OPERABLE UNIT 5 TILE LEACH FIELD

**NAVAL AIR STATION SOUTH WEYMOUTH
WEYMOUTH, MASSACHUSETTS**

**BRAC PMO NORTHEAST
U.S. NAVY**

April 2006

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**Record of Decision
Naval Air Station South Weymouth
Part 1—Declaration**

PART 1—DECLARATION

I. SITE NAME AND LOCATION

Naval Air Station South Weymouth
1134 Main Street
Weymouth, Massachusetts 02190
MA2170022022
Operable Unit 5 – Tile Leach Field

Appendices provided herein include: Appendix A – Massachusetts Department of Environmental Protection Letter of Concurrence; Appendix B – References; Appendix C – Glossary; Appendix D – Administrative Record Index; Appendix E.1 – Public Comments on the Proposed Plan for the Tile Leach Field; Appendix E.2 – Transcript of Public Hearing on the Proposed Plan for the Tile Leach Field; Appendix F – Human Health Risk Assessment Tables from the Phase II RI, and Appendix G – “Massachusetts Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil” and A Comparison of NAS South Weymouth Background Concentrations.

II. STATEMENT OF BASIS AND PURPOSE

This decision document presents the No Action decision for Operable Unit 5 (OU-5), the Tile Leach Field, at the Naval Air Station (NAS) South Weymouth, Weymouth, Massachusetts, which was chosen in accordance with the Comprehensive Environmental Response, Compensation, and Liability Act of 1980 (CERCLA), 42 USC § 9601 *et seq.*, as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA), and to the extent practicable, the National Oil and Hazardous Substances Pollution Contingency Plan (NCP), 40 CFR Part 300 *et seq.*, as amended. The regulatory program performed under the context of these combined laws and regulations is commonly referred to as “Superfund.”

This decision is based on the Administrative Record, which has been developed in accordance with Section 113(k) of CERCLA, and which is available for review at the Navy's Caretaker Site Office at the NAS South Weymouth in Weymouth, Massachusetts. Public information repositories are also kept at the Tufts Library in Weymouth, Massachusetts; the Abington Public Library in Abington, Massachusetts; the Hingham Public Library in Hingham, Massachusetts; and the Rockland Memorial Library in Rockland, Massachusetts. The Administrative Record Index (Appendix D) identifies each of the items comprising the Administrative Record upon which the selection of this decision is based.

This decision had been selected by the Navy and the U.S. Environmental Protection Agency (EPA). The Navy and the EPA have determined that No Action is necessary to protect public health or welfare or the environment. The Massachusetts Department of Environmental Protection (MADEP) concurs with the No Action decision (Appendix A).

III. DESCRIPTION OF THE SELECTED DECISION

This Record of Decision (ROD) sets forth the No Action decision for OU-5, the Tile Leach Field, at NAS South Weymouth.

Based upon the completed investigations, the Navy has concluded that No Action is appropriate for the Tile Leach Field. Risk calculations for human health did not exceed regulatory thresholds for either current or conservative future site use scenarios. No significant ecological risks were identified at the site. Results from the focused groundwater investigation conducted in 2005 indicated that 1,4-dioxane was not present in the groundwater at the site, confirming the conclusions of the ecological and human health risk assessments.

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OU-5, the Tile Leach Field, is one of several operable units currently on record at NAS South Weymouth. The Tile Leach Field has been addressed independently from the rest of NAS South Weymouth so that the Navy can proceed with closure of this site as soon as it has met the requirements of the Superfund process. Because of the No Action decision, the signing of this ROD by the Navy and EPA Region 1 will indicate the completion of the Superfund process for the Tile Leach Field. The No Action decision for the Tile Leach Field is not expected to have any impact on the strategy or progress for the rest of the sites at NAS South Weymouth.

IV. STATUTORY DETERMINATIONS

No cleanup action is necessary at the Tile Leach Field under CERCLA to ensure protection of human health and the environment. No additional actions, investigations, monitoring, or 5-year reviews will be required.

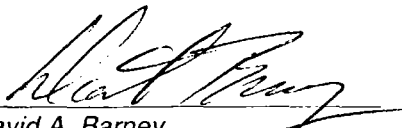
V. AUTHORIZING SIGNATURES

This ROD documents that No Action is necessary to ensure protection of human health and the environment for OU-5, the Tile Leach Field, at the former NAS South Weymouth. This decision was selected by the Navy and EPA, with concurrence by MADEP.

Concur and recommended for immediate implementation:

U.S. Department of the Navy

By: _____



David A. Barney
BRAC Environmental Coordinator
NAS South Weymouth
BRAC PMO Northeast
U.S. Navy

Date: _____

May 1, 2006

U.S. Environmental Protection Agency, Region 1

By: _____


Director, Office of Site Remediation and Restoration
Region 1 – New England
U.S. EPA

Date: _____

05/03/06

**Record of Decision
Naval Air Station South Weymouth
Part 2—Decision Summary**

PART 2—DECISION SUMMARY

I. SITE NAME, LOCATION, AND DESCRIPTION

NAS South Weymouth was placed on the National Priorities List (NPL) in May 1994 by EPA pursuant to CERCLA. During its operational period, NAS South Weymouth (the Base) was owned by the U.S. Government, and was operated by the Department of the Navy. The Base is located primarily in the Town of Weymouth, Massachusetts (Figure 2-1). Portions of NAS South Weymouth extend into the adjacent Towns of Abington and Rockland, Massachusetts. NAS South Weymouth was developed during the 1940s for dirigible aircraft used to patrol the North Atlantic during World War II. The facility was closed at the end of the war and reopened in 1953 as a Naval Air Station for aviation training. NAS South Weymouth was in continuous use since that time until it was operationally closed on 30 September 1996 and administratively closed on 30 September 1997. The Department of the Navy is the lead agency, and EPA is the support agency, for CERCLA activities at NAS South Weymouth. The U.S. Department of Defense is the sole source of cleanup funding for the property. There are several operable units within the NAS South Weymouth NPL site (MA2170022022) that the Navy is addressing under CERCLA. This ROD relates to the Tile Leach Field, which has been designated as OU-5.

The Tile Leach Field is a 0.3-acre parcel located in the west-central portion of the base, adjacent to French Stream (Figure 2-2). The site is currently comprised of a relatively flat, unpaved area bordered by French Stream to the west. The western portions of the site are covered with shrubs and young tree growth and the area to the east is covered with small shrubs and grass (Figure 2-3). Wetlands are located west of the site along French Stream and south of the site along the adjoining drainage ditch. The stream and drainage ditch sometimes receive overland surface water flow. The major surface features are shown in plan view on Figure 2-2.

A more complete description of the Tile Leach Field can be found in Section 3 of the Phase II Remedial Investigation (RI) Report (Tetra Tech NUS, 2002).

II. SITE HISTORY AND ENFORCEMENT ACTIVITIES

A. Site History

Between approximately 1945 and the early 1950s, the Tile Leach Field was used for the disposal of sanitary wastes pumped via underground pipes from the former Hangar 2, which was used for the storage and maintenance of military dirigibles (blimps). A video survey completed in 2004 confirmed the connection from the hangar's sanitary system to a lift station and then to the Tile Leach Field. The hangar was demolished in 1953. The leach field consisted of four porous clay pipes, also called "tiles," located approximately 2 feet beneath ground surface and surrounded by gravel. The pipes were approximately 250 feet long and connected to a distribution box northwest of the site. The distribution lines and gravel troughs were laid in a rectangular sand bed, which is shown in Figure 2-2.

Given the use of the former hangar, there were initial concerns that the Tile Leach Field may have received gasoline, other fuels, and potentially battery acid via the hangar's sewer system. A video survey of the hangar's floor drain system was completed as part of a maintenance action in 2004 (Tetra Tech EC, 2006). The survey confirmed that the floor drains were connected to the storm sewer system, and were not connected to the Tile Leach Field.

A more detailed description of the site history can be found in Section 1.0 of the Phase II RI Report (Tetra Tech NUS, 2002).

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B. History of Site Investigations

Previous investigations and the enforcement activities at the Tile Leach Field are summarized below:

- **Installation Restoration (IR) Program, 1983**—In response to the growing awareness of the potential effects of hazardous materials on human health and the environment, the Department of Defense developed the IR Program to investigate and clean up potential problem areas created by past events at federal facilities.
- **Preliminary Assessment (PA) (Argonne National Laboratory, 1988)**—The PA included a records search, interviews, and a site walkover. The purpose of the PA was to identify and evaluate past waste practices at NAS South Weymouth and assess the associated potential for environmental contamination. As a result of the PA, five sites, including the Tile Leach Field, were recommended for further study.
- **Site Inspection (SI) (Baker Environmental, Inc., 1991)**—The SI included site walkovers; geophysical surveys; installation of groundwater monitoring wells; and the collection of soil, sediment, surface water, and groundwater samples at eight sites on the NAS South Weymouth property. The intent of the SI was for “screening” purposes to assess the potential for contaminant migration, provide data for Hazard Ranking System scoring, and to provide the information necessary to develop a comprehensive work plan for further study. The 1991 SI report recommended that no further investigations be conducted at the Tile Leach Field because there was no evidence that waste had been disposed of at the site. However, based on discussions with the regulatory agencies, additional study was warranted to support regulatory concurrence with Navy’s recommendation for the site. The Tile Leach Field was therefore retained for inclusion in the Phase I RI.
- **Phase I RI (Brown and Root Environmental, 1996)**—The Phase I RI included a literature search; geophysical and soil vapor surveys; immunoassay testing; ecological assessment; test pit excavation; monitoring well and piezometer installation; hydraulic conductivity testing; groundwater and stream gauging; and sampling of soil, sediment, surface water, and groundwater. The Phase I RI concluded that additional investigation was necessary at seven sites, including the Tile Leach Field.
- **Phase II RI (Tetra Tech NUS, 2002)**—The Phase II RI was conducted to address data gaps from the Phase I RI and previous investigations and to estimate potential human health and ecological risks. The Phase II RI included further sampling of soil, groundwater, surface water, and sediment (from the drainage ditch and French Stream), as well as human health and ecological risk assessments. Results of the Phase II RI indicated that the chemicals detected at the Tile Leach Field do not pose unacceptable risks to human health or the environment. Accordingly, the risk assessments showed that cleanup of environmental media was not warranted at the Tile Leach Field to protect human health or the environment.
- **2005 Supplemental Groundwater Sampling Plan (Tetra Tech NUS, 2005)**—The 2005 supplemental groundwater sampling event was conducted to address comments from the regulators on the single detection of 1,4-dioxane in groundwater and the Navy’s proposed No Action decision for the Tile Leach Field. The Navy returned to the site and performed a focused groundwater investigation to evaluate 1,4-dioxane in the groundwater. 1,4-dioxane was not detected in the groundwater at the site, confirming the RI’s conclusion that the Tile Leach Field does not present significant risk to human health or the environment.

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C. History of CERCLA Enforcement Activities

In May 1994, NAS South Weymouth was listed on EPA's NPL, indicating that the NAS South Weymouth property was a priority for environmental investigation and cleanup. The Navy has conducted environmental studies and activities at NAS South Weymouth in accordance with CERCLA and the NCP. Based on the designation of NAS South Weymouth property as an NPL site, a Federal Facility Agreement was executed by the Navy and EPA, which became effective in April 2000. This agreement establishes the Navy as the lead agency for the investigation and cleanup of designated sites within NAS South Weymouth property, with EPA providing oversight. The MADEP is not party to the Federal Facility Agreement. In accordance with CERCLA and the NCP, MADEP has participated in ongoing discussions and strategy sessions, as well as provided oversight and guidance through their review of CERCLA documents. A Site Management Plan (SMP) with task schedules and deliverables is updated annually each June, and is published in October by the Navy. The SMP, which serves as a management tool for planning, reviewing, and setting priorities for environmental investigative and remedial response activities to be conducted at NAS South Weymouth, was completed in 1999, and is updated annually as applicable. The SMP is available for review at the Navy's EFANE office in Lester, Pennsylvania; Tufts Library in Weymouth, Massachusetts; Abington Public Library in Abington, Massachusetts; Hingham Public Library in Hingham, Massachusetts; Rockland Memorial Library in Rockland, Massachusetts; and the Department of the Navy Caretaker Site Office (CSO) in Weymouth, Massachusetts.

III. COMMUNITY PARTICIPATION

The Navy has worked to keep the community involved throughout the investigation and decision process. The Navy has kept the community and other interested parties apprised of site activities through informational meetings, fact sheets, press releases, public meetings, and regular contact with local officials. The Navy also meets on a regular basis to discuss the status and progress of the IR Program with the Restoration Advisory Board (RAB), which includes representatives from the neighboring communities. Representatives from the Navy, EPA Region I, MADEP, and local government have attended the public meetings and hearings. Below is a brief chronology of public outreach efforts:

- In September 1995, the Navy initiated a series of public meetings, at which the RAB process was explained and community members were asked to join the RAB. A sufficient number of volunteers were assembled and RAB meetings began in March 1996. Since that time, RAB meetings have been held on a monthly basis to keep the RAB and local community informed of the progress of the environmental cleanup programs.
- The Navy published a legal notice of the Proposed Plan for the Tile Leach Field in the *Patriot Ledger* on 25 October 2005, the *Weymouth News* on 26 October 2005, and the *Rockland Mariner* on 28 October 2005. Local community calendars and RAB members were notified of the meeting date for the public information session and public hearing. The Navy distributed copies of the Proposed Plan to a mailing list of approximately 400 community members. In addition, the Navy made the Proposed Plan available to the public at the Tufts Library in Weymouth, Massachusetts; Abington Public Library in Abington, Massachusetts; Hingham Public Library in Hingham, Massachusetts; Rockland Memorial Library in Rockland, Massachusetts; Department of the Navy CSO in Weymouth, Massachusetts; and the Navy's public website for environmental activities at the former NAS South Weymouth (<http://nas-southweymouth.navy-env.com>).
- From 24 October until 24 November 2005, the Navy offered the Proposed Plan for public comment, in accordance with the requirements of the NCP and the SMP developed for the NAS South Weymouth Superfund program. One set of written comments was received during this public comment period.

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- On 10 November 2005, the Navy held an informational meeting to present the Navy's Proposed Plan. At this meeting, representatives from the Navy discussed the Proposed Plan and answered questions from the public. In addition, the Navy held a public hearing to accept oral comments on the Proposed Plan. A transcript of comments received at the public hearing is included as Appendix E.2.
- The Navy has provided responses to comments received at the public hearing and during the comment period in the Responsiveness Summary, which is included in Part 3 of this ROD.

In addition, the Navy is providing an index of the Administrative Record available for public review at the Navy's Caretaker Site Office in Weymouth, Massachusetts. Information repositories have also been established at several locations. Currently, information is available at the Tufts Library in Weymouth, Massachusetts; the Abington Public Library in Abington, Massachusetts; the Hingham Public Library in Hingham, Massachusetts; and the Rockland Memorial Library in Rockland, Massachusetts. The Administrative Record Index is included as Appendix D of this ROD.

IV. SCOPE AND ROLE OF OPERABLE UNIT

OU-5 is one of several operable units at NAS South Weymouth (Table 2-1). Each operable unit at NAS South Weymouth progresses through the CERCLA cleanup process independent of one another.

The ROD for the Tile Leach Field is one component of the Superfund program at NAS South Weymouth. It has proceeded on an independent track to enable the Navy to expedite site closure and property transfer. The signing of this ROD by the Navy and EPA Region 1 will indicate the completion of the Superfund process for the Tile Leach Field. No additional actions or investigations of the Tile Leach Field are required under CERCLA, and the site may be returned to the communities for unrestricted exposure and unlimited use. The selected No Action decision for OU-5 is not expected to have an impact on the strategy or progress for the remaining sites at NAS South Weymouth. Additional details on the strategy and schedule for the remediation of the other CERCLA sites at NAS South Weymouth are available in the SMP (Tetra Tech NUS, 2005a).

V. SITE CHARACTERISTICS

The Tile Leach Field is located in the west-central portion of the base, adjacent to French Stream (Figure 2-2). The Tile Leach Field was used between 1945 and the early 1950s for the disposal of sanitary wastes pumped via underground pipes from the former Hangar 2, which was used for the storage and maintenance of military dirigibles (blimps). The hangar was demolished in 1953. The leach field consisted of four porous clay pipes, also called "tiles," located approximately 2 feet beneath ground surface and surrounded by gravel. The pipes were approximately 250 feet long and connected to a distribution box northwest of the site. The distribution lines and gravel troughs were laid in a rectangular sand bed, which is shown in Figure 2-2.

The area of the Tile Leach Field is approximately 13,000 ft² (0.3 acres). The site is currently comprised of a relatively flat, unpaved area bordered by French Stream to the west. The western portions of the site are covered with shrubs and young tree growth and the area to the east is covered with small shrubs and grass. Wetlands are located west of the site along French Stream and south of the site along the adjoining drainage ditch. The stream and drainage ditch sometimes receive overland surface water flow.

During the 1996 and 1999 field programs for the Phase I and Phase II RI reports, respectively, the Navy collected surface soil, subsurface soil, sediment, groundwater, and surface water samples from the Tile Leach Field. As exact materials disposed of were unknown, the samples were analyzed for a wide range of contaminants. The analytical program included volatile organic compounds, semivolatile organic

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compounds, pesticides, polychlorinated biphenyls, and inorganics. Figures 2-4a and 2-4b depict the sample locations. The RI also included an assessment for the presence of light non-aqueous phase liquid (LNAPL). No LNAPL was found.

The Navy returned to the site in 2005 and performed a focused groundwater investigation to evaluate 1,4-dioxane in the groundwater. This investigation included sampling groundwater in all site wells for 1,4-dioxane; 1,4-dioxane was not detected (Tetra Tech NUS, 2005).

The Conceptual Site Models for the human health and ecological risk assessments as well as the results of the risk assessments are presented in Section VII, *Summary of Potential Site Risks*.

VI. CURRENT AND POTENTIAL FUTURE SITE AND RESOURCE USES

The Tile Leach Field has not been used since the early 1950s. Under current use of the former NAS South Weymouth, there are no regular activities occurring at the Tile Leach Field; therefore, there is limited potential for current worker exposure. Human activity is limited to possible brush clearing or grass cutting during summer months. It is possible that sewer or utility line repair work could occur at the site. NAS South Weymouth is operationally closed, and access to the Base is generally controlled by fencing, vehicle gates, and administrative staff. However, based on the proximity to residences and roads that are open to the public, the Tile Leach Field has been identified as having the potential for exposure by trespassers. The Tile Leach Field is also located close to French Stream. French Stream is likely to be attractive to trespassers for wading.

Specific land re-use plans are currently in the early stages of environmental review in accordance with the Massachusetts Environmental Policy Act (MEPA) as of this writing. The zoning for redevelopment of the Base, including the Tile Leach Field property, has been set in the document *Zoning and Land Use By-Laws for the Naval Air Station South Weymouth* (May 2005), which was approved and adopted by the townships of Weymouth on 25 July 2005, Abington on 20 June 2005, and Rockland on 6 July 2005. Accordingly, the future use of the property containing the Tile Leach Field is zoned as "open space/corporation district." This open space zoning is intended for the preservation of large, contiguous wetland areas and open space for park land, active and passive recreation, reservations, community gardens, rivers and streams, and similar uses. The zoning may also encompass wetland resource areas, open space, and recreational areas where there are interests in watershed and flood protection, preservation of wildlife habitat, and conservation of recreational land. No residential re-use is permitted under this zoning.

Groundwater beneath the site is not part of the Potentially Productive Aquifer zones designated at NAS South Weymouth. Therefore, site groundwater is not considered to be a Potential Drinking Water Source Area.

As summarized in Section VII, the conditions at the site are suitable for unrestricted exposure and unlimited use.

VII. SUMMARY OF POTENTIAL SITE RISKS

A baseline risk assessment was performed as part of the Phase II RI to estimate the probability and magnitude of potential adverse human health and environmental (ecological) effects from exposure to the site assuming no remedial action was taken. Should unacceptable risks be determined, it provides the basis for taking action and identifies the contaminants and exposure pathways that need to be addressed by the remedial action. Based on the lack of unacceptable risks, remedial action is not necessary as discussed below in the human health and ecological summaries of the baseline risk assessment.

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A. Human Health Risk Assessment

A baseline human health risk assessment (HHRA) was completed as part of the Phase II RI (Tetra Tech NUS, 2002) to estimate the probability and magnitude of potential adverse human health effects from exposure to chemicals of potential concern (COPCs) associated with soils, groundwater, surface water, and sediment at the Tile Leach Field, assuming no remedial action was taken.

The HHRA, which supports the No Action decision, followed a 4-step process: (1) contaminant identification that identified those hazardous substances which, given the specifics of the site, were of potential concern; (2) exposure assessment that identified actual or potential exposure pathways, characterized the potentially exposed populations, and determined the extent of possible exposure; (3) toxicity assessment that considered the types and magnitude of adverse health effects associated with exposure to hazardous substances; and (4) risk characterization that integrated the three earlier steps to summarize the potential and actual risks posed by hazardous substances at the site, including carcinogenic and non-carcinogenic risks.

The HHRA was conducted in accordance with regional and federal EPA guidance and was approved by EPA Region I (Tetra Tech NUS, 2002). The results of the HHRA were used to determine that the risks calculated for receptors at the site did not exceed EPA's benchmarks for acceptable cancer or non-cancer risks at the Tile Leach Field.

Chemicals of potential concern (COPCs) were determined in the screening assessment portion of the HHRA (step one of the process described above) based on toxicity, concentration, and comparison to background concentrations. As a conservative measure, EPA Region III risk-based concentrations (RBCs) for residential soil were employed for the screening analysis for both soil and sediment. EPA Region III RBCs for residential tap water were employed for the screening analysis for groundwater. Water Quality Criteria (WQC) were employed for the screening analysis for surface water, except for those analytes without WQC, for which tap water RBCs were used. The results of this screening are shown in Tables 6-1 through 6-3 of the Phase II RI report (Tetra Tech NUS, 2002). These tables are presented in Appendix F.

Conceptual Site Model

Potential human health effects associated with COPCs were estimated quantitatively through the development of several hypothetical exposure pathways. These pathways were developed to reflect the potential for exposure to COPCs based on the present uses, potential future uses, and location of the site. A human health conceptual site model (CSM) which depicts these pathways is provided in Figure 2-5. Specific sources of COPCs, release mechanisms, exposure pathways to receptors, and site-specific factors have been presented in the Phase II RI report (Tetra Tech NUS, 2002). Human health risks were calculated for exposures to COPCs identified in all media at the site. The following receptor scenarios were evaluated: on-site worker (employee entering the site to clear brush and cut grass on a frequent, but not full-time basis), construction worker (full-time employee during a time-limited project), residential (adult, child), child trespasser, and child recreational user. Exposure pathways included incidental ingestion of soil, dermal contact with soil, and inhalation of soil particulate; incidental ingestion of and dermal contact with sediments; incidental ingestion and dermal contact with surface water; inhalation of volatiles while showering with groundwater; and ingestion of groundwater.

Specific pathways evaluated for each receptor are delineated in the CSM (Figure 2-5). These pathways were developed to reflect the potential for exposure to hazardous substances based on the present use, potential future uses, and location of the site. Risks were calculated using both reasonable maximum exposure (RME) and central tendency exposure (CTE) assumptions. The CTE scenario uses average values for exposure parameters and represents an "average case" exposure scenario. The RME scenario uses maximum values for exposure parameters. The RME scenario is intended to provide an

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upper bound of the possible risk. The RME is conceptually the “high end” exposure, above the 90th percentile of the population distribution, but not higher than the individual in the population with the highest exposure. Since the RME scenario represents a “reasonable worst case” exposure scenario, further discussions of risks in this ROD focus on the RME scenario. Tables 6-17 through 6-20 of the Phase II RI show a summary of the COPCs and exposure point concentrations used to evaluate the RME scenario. Exposure assumptions are presented in Tables 6-11 through 6-16 of the Phase II RI. These tables are presented in Appendix F.

Excess lifetime cancer risks were determined for each exposure pathway by multiplying a daily intake level with the chemical-specific cancer potency factor. Cancer potency factors have been developed by EPA from epidemiological or animal studies to reflect a conservative “upper bound” of the risk posed by potentially carcinogenic compounds. That is, true risk is unlikely to be greater than the risk predicted. The resulting risk estimates are expressed in scientific notation as a probability (e.g., 1×10^{-6} for 1/1,000,000) and indicate (using this example) that an average individual is not likely to have greater than a one in a million chance of developing cancer over a 70-year lifetime as a result of site-related exposure (as defined) to the compound at the stated concentration.

EPA’s generally acceptable risk range for site-related exposure is from 10^{-4} to 10^{-6} . Current EPA practice considers carcinogenic risks to be additive when assessing exposure to a mixture of hazardous substances.

In assessing the potential for adverse health effects other than cancer, a hazard quotient is calculated by dividing the daily intake level by the reference dose or other suitable benchmark. Reference doses have been developed by EPA, and they represent a level to which an individual may be exposed that is not expected to result in any deleterious effect. Reference doses are derived from epidemiological or animal studies and incorporate uncertainty factors to ensure that adverse health effects will not occur. A hazard quotient less than one indicates that a receptor’s dose of a single chemical is less than the reference dose, and that toxic non-carcinogenic effects from that chemical are unlikely. The hazard index (HI) is generated by adding the hazard quotients for all COPCs that affect the same target organ (e.g., liver) within or across all media to which a given individual may reasonably be exposed. An HI less than one indicates that toxic non-carcinogenic effects are not likely.

Human Health Risk Assessment Results

RME risk results for all receptors across all media of concern at the site are presented in tables from the Phase II RI (Tetra Tech NUS, 2002). These RME risk tables are included in Appendix F. Table 2-2 summarizes the human health risk assessment results for current and potential future use corresponding to the RME scenario at the Tile Leach Field. The results of the risk assessment conducted to evaluate potential human health risks resulting from potential exposures at the Tile Leach Field indicate:

- Cumulative non-cancer HIs were less than EPA’s risk target of HI = 1.0 for all receptors.
- Cumulative cancer risk estimates for all receptors were below or within EPA’s “acceptable risk range” of 10^{-6} to 10^{-4} .

No contaminants of concern (COCs) were determined for the site. Therefore, there are no concerns for potential risks from exposure to carcinogens or non-carcinogens in any medium at the site, and no remediation is necessary for the site to be protective of human health.

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B. Ecological Risk Assessment

In addition to the human health risk assessment described above, the Navy also completed an ecological risk assessment for the site. The ecological risk assessment evaluated potential risks to ecological receptors that may occur in the presence of chemical stressors in environmental media. The ecological risk assessment was completed in three steps: (1) problem formulation, (2) risk analysis, and (3) risk characterization.

Problem Formulation

The Navy collected and evaluated information about the site conditions (e.g., type of habitat, and types of plant and animal species at the site), the COPCs, and the potential exposure pathways. As shown in Table 2-3, the following chemicals were identified as ecological COPCs: inorganics, pesticides, and SVOCs in surface soil; inorganics, pesticides, PCBs, SVOCs, and one VOC in sediment; and dissolved phase and total inorganics and one SVOC in surface water. The ecological receptor groups evaluated included terrestrial vertebrates (e.g., small mammals, birds), terrestrial invertebrates, terrestrial plants, and aquatic/wetland organisms (e.g. finfish, benthic macroinvertebrates, and amphibians).

Risk Analysis

Similar to the human health risk assessment, the Navy evaluated the possible harmful effects to the ecological receptors from the COPCs. The chemical concentrations to which the ecological receptors might be exposed were determined by sampling soil, water, and sediment. These concentrations were used directly to determine risk to plants and invertebrates. Sediment toxicity tests and a macroinvertebrate survey were also used to determine risk to aquatic and benthic invertebrates. Potential exposure for terrestrial and wetland vertebrates was determined in food chain models based on the sampling data, and also included estimates of COPC exposure via ingestion of plant and animal tissue. These biota concentrations were extrapolated from concentrations in abiotic media using bioaccumulation factors cited in technical references.

The ecological exposure pathways evaluated included direct contact with and/or ingestion of surface soil by terrestrial invertebrates; direct contact with surface soil by terrestrial plants; wildlife ingestion of food items that are potentially contaminated as a result of accumulation of constituents from surface soil; and incidental ingestion of surface soil by wildlife. Direct exposure to and consumption of sediment and surface water were examined for wetland vertebrates and aquatic and benthic invertebrates. Ecological risks from exposure to subsurface soil were not assessed because ecological receptors are not expected to contact soil below two feet. The exposure pathways used in the ecological risk assessment are presented in Table 2-4. The ecological risk assessment CSM is depicted in Figure 2-6.

Exposure estimates for wildlife were compared to literature toxicity values for birds or mammals to calculate a hazard quotient (HQ). An HQ greater than 1.0 indicates potential unacceptable risk.

Risk Characterization

The results from the risk analysis were used to determine the probability of adverse effects to the ecological receptors at the site. The result of an ecological risk assessment is based on an interpretation of the overall weight of evidence collected from the site.

The results of the ecological risk assessment indicated that the conditions at the site pose no significant risks to ecological receptors. Refer to Section 7.0 of the Phase II RI (Tetra Tech NUS, 2002) for a more comprehensive ecological risk summary.

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In summary, the risk assessments did not identify potential human health or ecological risks (i.e., risks to the environment) associated with the Tile Leach Field in excess of regulatory thresholds.

VIII. DOCUMENTATION OF NO SIGNIFICANT CHANGES

The Navy presented a Proposed Plan for No Action at a public meeting on 10 November 2005. The Navy reviewed the comments submitted during the public comment period (Appendixes E.1 and E.2). As summarized in the Responsiveness Summary (Part 3), it was determined that no significant changes to the decision, as originally identified in the Proposed Plan, were necessary. Therefore, No Action will be implemented at the Tile Leach Field.

IX. STATE ROLE

MADEP concurs with the Navy's and EPA's No Action decision for OU-5 at NAS South Weymouth (see Appendix A).

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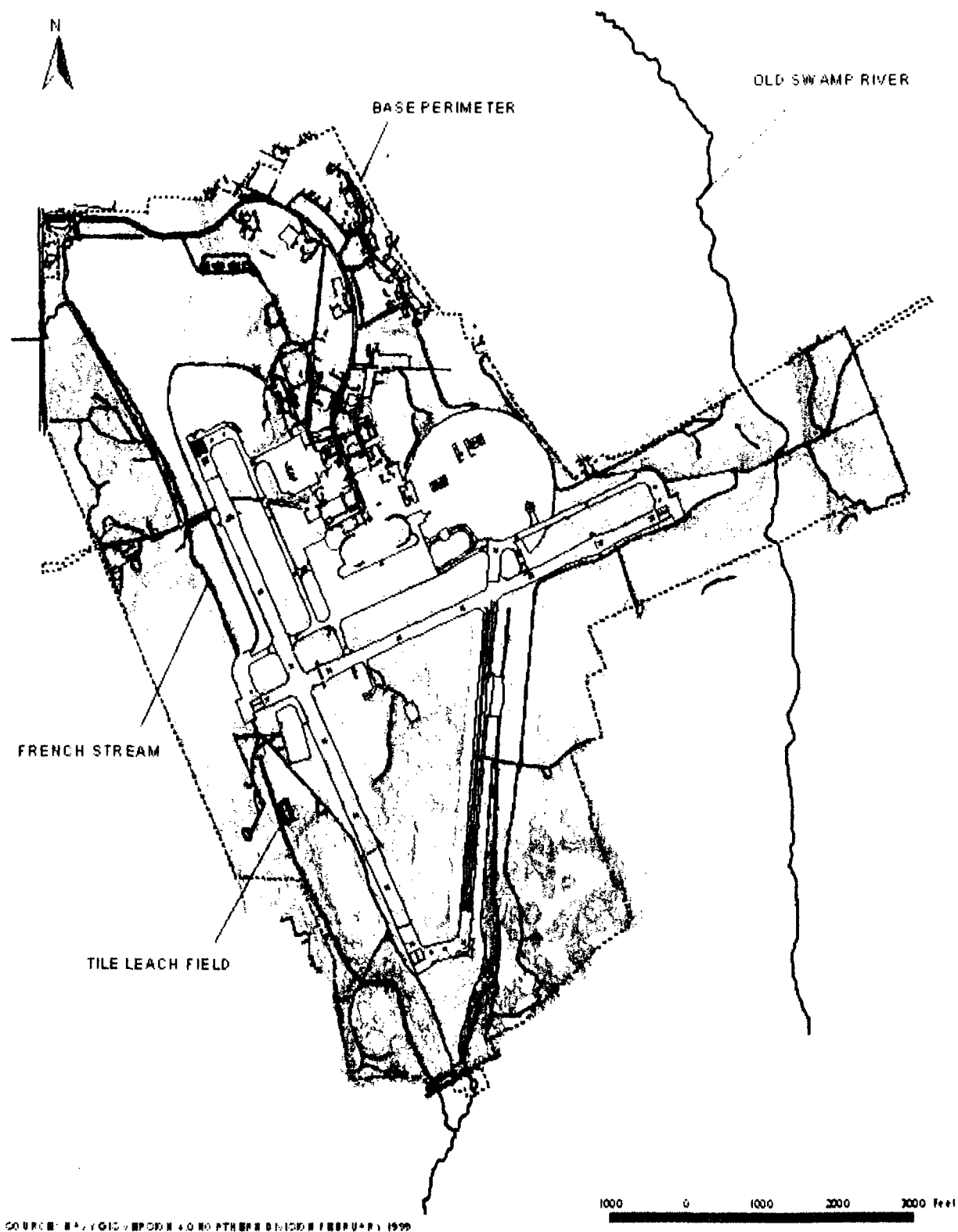
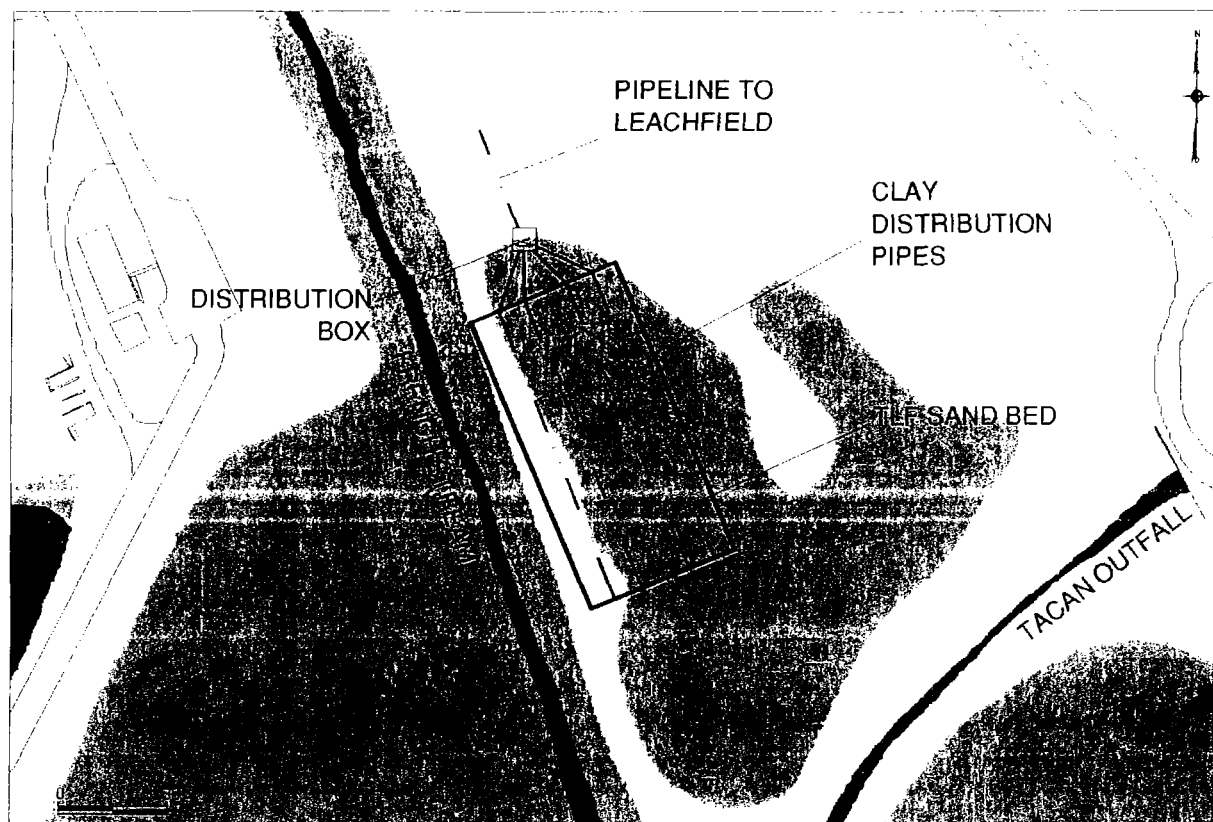


Figure 2-1. Site Location Map

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**Figure 2-2.
Site Map of the Tile Leach Field Features (approximate locations),
Vegetated Areas Shown in Green.**

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Figure 2-3. Site Photograph – East Side of Site Facing West, toward the Center of the Tile Leach Field, with Well TW-01 in Foreground. Other Wells are within the Tree-line.

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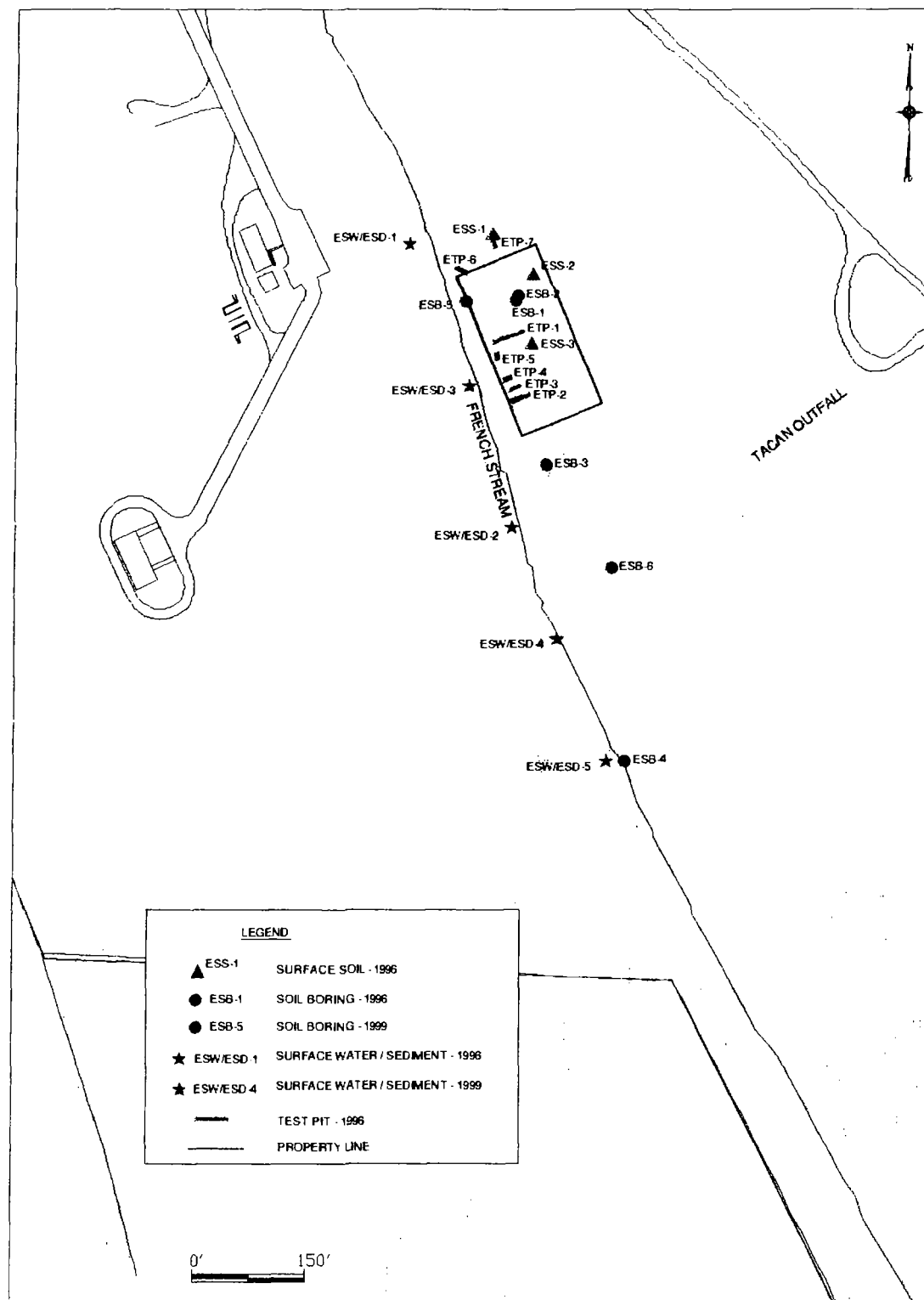


Figure 2-4a. Surface Water/Sediment Sample, Soil Sample, and Test Pit Locations

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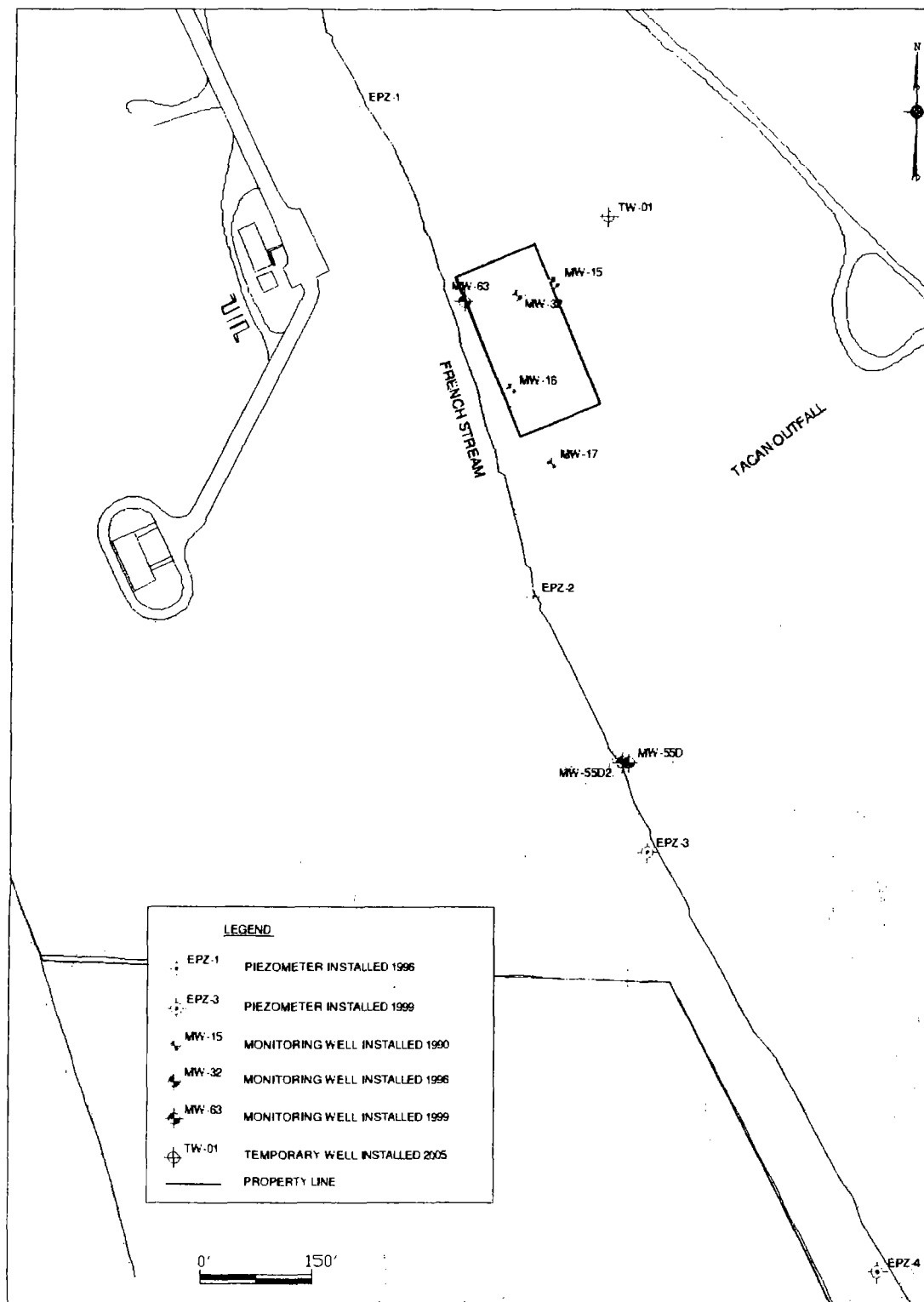
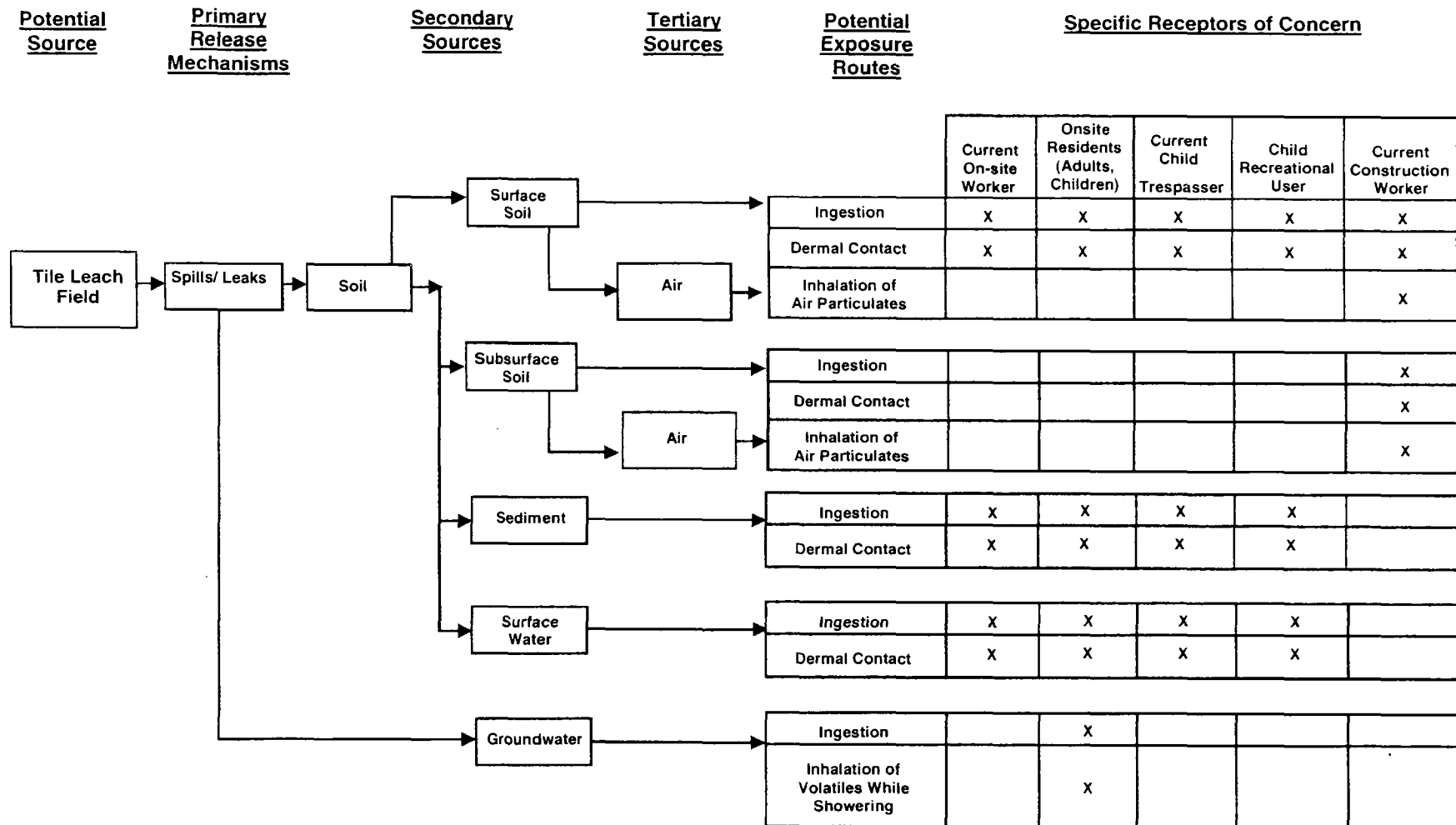


Figure 2-4b. Monitoring Well, Piezometer, and Temporary Well Locations.

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Figure 2-5. Human Health Conceptual Site Model

Source: Data from the RI (Tetra Tech NUS, 2002).



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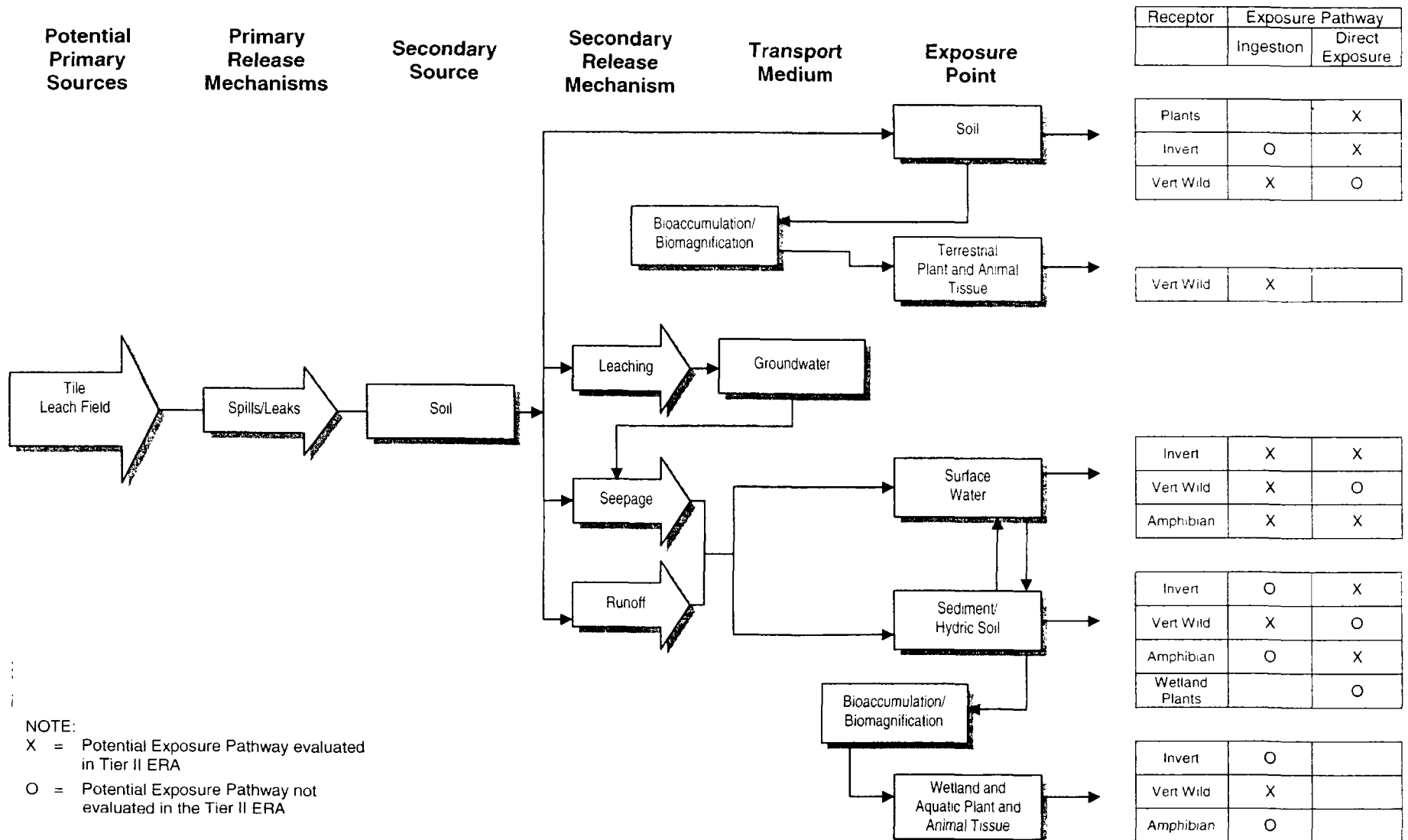


Figure 2-6. Ecological Risk Assessment Conceptual Site Model

Source: Figure 7-5 Phase II Remedial Investigation (Tetra Tech NUS, 2002)

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TABLE 2-1 SUMMARY OF OPERABLE UNITS

| Site | IR Program Site Designation | Operable Unit Designation | Site Abbreviation | Site Description | Regulatory Status (as of December 2005) |
|--|-----------------------------|-----------------------------------|-------------------|---|---|
| West Gate Landfill | 1 | 1 | WGL | Disposal area used for a variety of construction and demolition debris, municipal, and other waste materials. | PA, SI, RI, and FS completed. PRAP is in review. |
| Rubble Disposal Area (Upland) | 2 | 2 | RDA | Disposal area used for primarily building demolition debris. | PA, SI, RI, FS, PRAP, ROD, Remedial Design, Remedial Action is nearly completed. |
| Small Landfill | 3 | 3 | SL | Disposal area used primarily for concrete, metal, and wood. | PA, SI, RI, PRAP, and ROD (No Action with groundwater monitoring) completed. Monitoring program completed. Closure under MA Solid Waste Regulations underway. |
| Fire Fighting Training Area | 4 | 4 | FFTA | Area designated for dispensing fuels for igniting and extinguishing fires. | PA, SI, and RI completed. No FS required. PRAP and ROD completed. MCP assessment underway. |
| Tile Leach Field | 5 | 5 | TLF | Sand bed used to receive and distribute treated industrial wastewater. | PA, SI, and RI completed. No FS required. PRAP finalized. |
| Fuel Farm | 6 | Not applicable (no longer CERCLA) | None | Tank farm and fuel dispensing area. | Site transferred into the MCP program based on exhibiting only fuel-related issues. |
| Sewage Treatment Plant | 7 | 7 | STP | Wastewater treatment plant used primarily for domestic wastewater. | PA, SI, and RI completed. FS report being finalized. |
| Abandoned Bladder Tank Fuel Storage Area | 8 | 8 | ABTFSA | Area in which aboveground tanks temporarily were stored in support of aircraft refueling training operations. | PA, SI, and RI completed. No FS necessary. Completed No Action PRAP and ROD. |
| Rubble Disposal Area | 2 | 9 | RDA | Steep sloping area adjacent to the RDA. | Combined with OU-2. No separate actions being performed. |
| Building 81 | 9 | 10 | None | Release of solvents from former motor pool. | Former MCP site moved to CERCLA program. Conducted <i>in situ</i> chemical oxidation pilot study for groundwater. Finalizing RI Work Plan. |
| Building 82 | 10 | 11 | None | Release of solvents from former aircraft hangar operations. | Former MCP site moved to CERCLA program. Finalizing RI Work Plan. |
| Solvent Release Area | 11 | 12 | SRA | Release of solvents from unidentified source. | Former EBS background location moved to CERCLA program. Finalizing RI Work Plan. |

NOTE: PA = Preliminary Assessment.
SI = Site Inspection.
RI = Remedial Investigation (Phase I and II).
FS = Feasibility Study.
PRAP = Proposed Remedial Action Plan.
CERCLA = Comprehensive Environmental Response, Compensation, and Liability Act.
ROD = Record of Decision.
MCP = Massachusetts Contingency Plan.
OU = Operable Unit.

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TABLE 2-2 SUMMARY OF HUMAN HEALTH RISK ASSESSMENT RESULTS

| Scenario Evaluated | Media | Total Carcinogenic Risk (Statistical Chance) | Total Non-Carcinogenic Risk (Hazard Index) |
|--|-----------------|---|---|
| SITE WORKER | | | |
| Ingestion/Dermal Contact | Surface Soil | NC | 0.0064 |
| | Sediment | 7.3E-08 | 0.0019 |
| | Surface Water | 2.4E-09 | 0.00025 |
| Site Worker Total | | 7.6E-08 | 0.0085 |
| TRESPASSING CHILD | | | |
| Ingestion/Dermal Contact | Surface Soil | NC | 0.0066 |
| | Sediment | 5.0E-07 | 0.030 |
| | Surface Water | 2.4E-08 | 0.0057 |
| Trespassing Child Total | | 5.3E-07 | 0.042 |
| CONSTRUCTION WORKER | | | |
| Ingestion/Dermal Contact | Surface Soil | NC | 0.011 |
| | Subsurface Soil | NC | NC |
| Inhalation | Surface Soil | NC | 0.12 |
| | Subsurface Soil | NC | NC |
| Construction Worker Total | | NC | 0.13 |
| FUTURE RESIDENT (a) | | | |
| Ingestion/Dermal Contact | Surface Soil | NC | 0.11 |
| | Sediment | 1.5E-06 | 0.15 |
| | Surface Water | 4.7E-08 | 0.019 |
| | Drinking Water | 6.5E-05 | 0.60 |
| Future Resident Total | | 6.6E-05 | 0.88 |
| FUTURE RECREATIONAL CHILD (1-6) | | | |
| Ingestion/Dermal Contact | Surface Soil | NC | 0.10 |
| | Sediment | 1.4E-06 | 0.15 |
| | Surface water | 4.2-08 | 0.019 |
| Future Recreational Child (1-6) Total | | 1.4E-06 | 0.27 |

SOURCE: Data from the RI (Tetra Tech NUS, 2002).

NOTES:

NC = Not calculated; not a chemical of potential concern in this medium or no dose-response value available.

The risk estimates shown are for Reasonable Maximum Exposure (RME) conditions.

- (a) No risk results are presented for groundwater inhalation of volatile organic compounds (VOCs) while showering for this scenario (see Figure 2-5) because no VOCs in groundwater other than ammonia were retained beyond the COPC screening step of the HHRA and there are no toxicity values available for ammonia.

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**TABLE 2-3 SUMMARY OF CHEMICALS OF POTENTIAL CONCERN USED
IN ECOLOGICAL RISK ASSESSMENT**

| Exposure Medium | Chemical of Potential Concern | Minimum Concentration | Maximum Concentration | Units | Maximum Exposure Point Concentration | Units | Statistical Measure |
|-----------------|---|-----------------------|-----------------------|-------|--------------------------------------|-------|---------------------|
| Surface Soil | Inorganics | | | | | | |
| | Aluminum | 3,410 | 19,800 | ppm | 19,800 | ppm | Max |
| | Barium | 13 | 18 | ppm | 18 | ppm | Max |
| | Chromium | 4.9 | 7.6 | ppm | 7.6 | ppm | Max |
| | Cobalt | 1.10 | 1.70 | ppm | 1.70 | ppm | Max |
| | Copper | 4 | 5 | ppm | 5 | ppm | Max |
| | Iron | 5,220 | 12,800 | ppm | 12,800 | ppm | Max |
| | Lead | 12 | 16 | ppm | 16 | ppm | Max |
| | Manganese | 61 | 121 | ppm | 121 | ppm | Max |
| | Nickel | 2.90 | 2.90 | ppm | 2.90 | ppm | Max |
| | Selenium | 2.00 | 2.00 | ppm | 2.00 | ppm | Max |
| | Vanadium | 10 | 17 | ppm | 17 | ppm | Max |
| | Zinc | 14 | 20 | ppm | 20 | ppm | Max |
| | Pesticides/Polychlorinated Biphenyls | | | | | | |
| | 4,4'-DDE | 4.60 | 7.60 | ppb | 7.60 | ppb | Max |
| | 4,4'-DDT | 2.7 | 10.0 | ppb | 10.0 | ppb | Max |
| | Endrin Aldehyde | 1.10 | 1.1 | ppb | 1.1 | ppb | Max |
| | Semivolatile Organic Compounds | | | | | | |
| | Bis(2-ethylhexyl)phthalate | 77 | 77 | ppb | 77 | ppb | Max |
| | Chrysene | 59 | 59 | ppb | 59 | ppb | Max |
| | Fluoranthene | 81 | 81 | ppb | 81 | ppb | Max |
| | Phenanthrene | 47 | 47 | ppb | 47 | ppb | Max |
| | Pyrene | 75 | 75 | ppb | 75 | ppb | Max |
| | Total polycyclic aromatic hydrocarbons | 262 | 262 | ppb | 262 | ppb | Max |
| Sediment | Inorganics | | | | | | |
| | Antimony | 0.44 | 8.10 | ppm | 8.10 | ppm | Max |
| | Arsenic | 1.1 | 6.8 | ppm | 5.9 | ppm | 95%UCL |
| | Beryllium | 0.83 | 2.90 | ppm | 2.90 | ppm | Max |
| | Cadmium | 0.16 | 1.50 | ppm | 1.50 | ppm | Max |
| | Iron | 11,200 | 105,000 | ppm | 105,000 | ppm | Max |
| | Silver | 0.9 | 4.7 | ppm | 4.7 | ppm | Max |
| | Thallium | 0.55 | 3.60 | ppm | 3.60 | ppm | Max |
| | Vanadium | 9 | 86 | ppm | 86 | ppm | Max |
| | Pesticides/Polychlorinated Biphenyls | | | | | | |
| | 4,4'DDD | 3 | 67 | ppb | 58 | ppb | 95%UCL |
| | 4,4'DDE | 2 | 11 | ppb | 11 | ppb | Max |
| | Aldrin | 2.8 | 3 | ppb | 2 | ppb | 95%UCL |
| | Alpha-chlordane | 1.9 | 33 | ppb | 33 | ppb | Max |
| | Aroclor 1260 | 640 | 640 | ppb | 640 | ppb | Max |
| | Gamma-chlordane | 2.2 | 30 | ppb | 30 | ppb | Max |
| | Total PCB | 640 | 640 | ppb | 640 | ppb | Max |
| | Semivolatiles | | | | | | |
| | Anthracene | 240 | 240 | ppb | 240 | ppb | Max |
| | Benzo(a)anthracene | 190 | 940 | ppb | 940 | ppb | Max |
| | Benzo(a)pyrene | 260 | 720 | ppb | 720 | ppb | Max |
| | Benzo(b)fluoranthene | 310 | 950 | ppb | 950 | ppb | Max |

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TABLE 2-3 (cont.)

| Exposure Medium | Chemical of Potential Concern | Minimum Concentration | Maximum Concentration | Units | Maximum Exposure Point Concentration | Units | Statistical Measure |
|-----------------|---------------------------------------|-----------------------|-----------------------|-------|--------------------------------------|-------|---------------------|
| Sediment | Benzo(g,h,i)perylene | 300 | 460 | ppb | 460 | ppb | Max |
| | Benzo(k)fluoranthene | 360 | 910 | ppb | 910 | ppb | Max |
| | Carbazole | 220 | 220 | ppb | 220 | ppb | Max |
| | Chrysene | 285 | 1,100 | ppb | 1,100 | ppb | Max |
| | Dibenz(a,h)anthracene | 280 | 280 | ppb | 280 | ppb | Max |
| | Fluoranthene | 460 | 1,600 | ppb | 1,600 | ppb | Max |
| | Fluorene | 200 | 200 | ppb | 200 | ppb | Max |
| | Indeno(1,2,3-cd)pyrene | 320 | 530 | ppb | 530 | ppb | Max |
| | Phenanthrene | 220 | 1,400 | ppb | 1,400 | ppb | Max |
| | Pyrene | 450 | 2,100 | ppb | 2,100 | ppb | Max |
| | Total polycyclic aromatic hydrocarbon | 3,320 | 11,630 | ppb | 11,630 | ppb | Max |
| Surface Water | Inorganics-Dissolved | | | | | | |
| | Aluminum | 61 | 140 | ppb | 140 | ppb | Max |
| | Barium | 35.8 | 45.3 | ppb | 45.3 | ppb | Max |
| | Iron | 1,830 | 4,170 | ppb | 4,170 | ppb | Max |
| | Manganese | 282 | 605 | ppb | 605 | ppb | Max |
| | Inorganics-Total | | | | | | |
| | Manganese | 363 | 606 | ppb | 593 | ppb | 95%UCL |
| | Semivolatiles | | | | | | |
| | Bis(2-ethylhexyl)phthalate | 12.5 | 12.5 | ppb | 12.5 | ppb | Max |

SOURCE: Data from the RI (Tetra Tech NUS, 2002).

NOTES: ppm = Parts per million (mg/kg).
95% UCL = 95% Upper Confidence Limit.
ppb = Parts per billion (µg/kg for soil and sediment; µg/L for water).

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TABLE 2-4 SUMMARY OF ECOLOGICAL RISK ASSESSMENT MEASUREMENT AND ASSESSMENT ENDPOINTS – SURFACE SOIL, SEDIMENT, AND SURFACE WATER

| Potential Receptor | Sensitive Environment (Yes/No) | Sensitive Species (Yes/No) ^(a) | Exposure Route Evaluated | Assessment Endpoints | Measurement Endpoints | Findings |
|---------------------------------|--------------------------------|---|---|--|---|---|
| Vertebrate Wildlife | No | No | Ingestion of soil, surface water, and sediment Ingestion of prey | Sustainability of terrestrial small animal and avian populations which reflect the available habitat at the TLF and can serve as a forage base for higher receptors. | <ul style="list-style-type: none"> • Sampling and analysis of surface soils, unfiltered surface water, and sediment from TLF. • Chemical measurements in excess of ingestion thresholds calculated from available toxicological data. | No significant potential ecological risk to terrestrial vertebrate wildlife due to exposure to TLF soil, sediment, and surface water, or ingestion of prey. |
| Terrestrial Invertebrates | No | No | Direct contact with soil | Sustainability of terrestrial invertebrate which reflects the available habitat at the TLF and can serve as a forage base for higher receptors. | <ul style="list-style-type: none"> • Comparison of surface soil COPCs concentrations to soil screening benchmarks. | No significant potential ecological risk to terrestrial invertebrate wildlife due to exposure to TLF soil. |
| Terrestrial Plants | No | No | Direct contact with soil | Sustainability of terrestrial plant community that reflects the available habitat at the TLF and can serve as a forage base for higher receptors. | <ul style="list-style-type: none"> • Comparison of surface soil COPCs concentrations to soil screening benchmarks. | No significant potential ecological risk to terrestrial plants due to exposure to TLF soil. |
| Aquatic and Wetland Vertebrates | No | No | Direct contact with sediment and surface water | Sustainability of healthy and well-balanced warmwater fish community in French Stream typical of comparable Massachusetts streams with similar structure, morphology, and hydrology. | <ul style="list-style-type: none"> • Comparison of total recoverable and dissolved metals concentrations in surface water to state and EPA acute and chronic water quality criteria for the protection of aquatic life. | No significant potential ecological risk to wetlands wildlife due to exposure to TLF sediment and surface water, or ingestion of prey. |

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TABLE 2-4 (cont.)

| Potential Receptor | Sensitive Environment (Yes/No) | Sensitive Species (Yes/No) ^(a) | Exposure Route Evaluated | Assessment Endpoints | Measurement Endpoints | Findings |
|-----------------------|--------------------------------|---|--|--|---|--|
| Aquatic Invertebrates | No | No | Direct contact with sediment and surface water | Sustainability of healthy and well-balanced benthic invertebrate community in French Stream, which is typical of comparable Massachusetts streams with similar structure, morphology, and hydrology. | <ul style="list-style-type: none"> • Comparison of sediment and surface water COPC concentrations to state benchmarks and water quality criteria. • Bulk sediment invertebrate toxicity tests. • Evaluation of simultaneously extracted metals (SEM)/acid volatile sulfides (AVS) relationships to indicate potential bioavailability of divalent cationic metals in sediment. • Field assessment of the benthic macroinvertebrate community-composition, abundance, and diversity metrics. | Amphipod growth endpoints were not significantly different from controls or background locations. Survival was significantly reduced when compared to one background sampling location, but was consistent with other background stations. Midge growth endpoints were significantly reduced at all three sediment sampling locations compared to controls and two background locations, but was not significantly different from the third background location. Midge survival was not significantly different from controls or background locations. There is a possibility that reductions may be COPC-related. No significant potential ecological risk to benthic invertebrates due to exposure to TLF sediment or surface water. |

SOURCE: Data from the RI (Tetra Tech NUS, 2002).

NOTES:

- (a) One state-listed threatened species, the Northern Harrier, occurs at and in the vicinity of the site; however, it is unlikely that they would use the terrestrial upland in and around the site for nesting. Further, it is not anticipated that this site will pose unacceptable ecological risk to this species. Future site activities, however, should adhere to state-mandated avoidance, protection, and mitigation measures based on the potential presence of this species. Two state-listed "species of special concern," the spotted turtle and the eastern box turtle, are known to occur at the Naval Air Station South Weymouth; however, despite extensive surveys, neither species has been located at or in the vicinity of the TLF.

TLF = Tile Leach Field.

COPC = Chemical of Potential Concern.

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Part 3—Responsiveness Summary**

PART 3—RESPONSIVENESS SUMMARY

I. STAKEHOLDER ISSUES AND NAVY RESPONSES

Verbal comments were received from one person during the public hearing on the Proposed Plan for OU-5, the Tile Leach Field. Written comments were received from one person during the public comment period. A copy of the transcript for the public hearing is provided as Appendix E.2. Responses to the verbal and written comments are provided in Section III of this Responsiveness Summary.

II. TECHNICAL AND LEGAL ISSUES

The one verbal comment received during the public hearing was in support of the work done by Navy. Navy does not believe any of the written comments necessitate a change from the No Action Proposal.

Therefore, the Navy and EPA believe that there is sufficient technical basis to proceed with the No Action ROD for the Tile Leach Field. By proceeding with the ROD, the Navy has completed all required CERCLA actions/investigations at the site.

III. COMMENT RESPONSES

Verbal Comment and Response

Note that the following verbal comment is paraphrased. Refer to the transcript (Appendix E.2) for the complete version of the comment recorded during the public hearing held on 10 November 2005.

Comment from Mr. Hayes—Mr. Hayes indicated his support for the work done by Navy.

Response—The Navy appreciates the public's support.

Note that a comment numbering system has been added to the following written comments to allow references in the responses to prior comments and to combine related consecutive comments. Responses have been added between each written comment.

Written Comment and Response

Comments from Mr. Wilmot

Comment 1 - I request that the Navy supply a detailed explanation of how it is possible that a site designated as CERCLA, can now be labeled "No Further Action" without any remedial action being done.

What in the 1991 Site Inspection testing done, alerted the Navy that further investigation was warranted?

What test results prior to 1994 when the Tile Leach Field was designated a Superfund site, alerted the Navy to list this site under CERCLA?

Response – NAS South Weymouth was added to the National Priority List (NPL) on May 31, 1994 based on its history of hazardous waste operations and potential for site contamination. Although the entire base is considered to be one site under CERCLA, it is divided into several operable units (OUs). Between approximately 1945 and the early 1950s, the Tile Leach Field was used for the disposal of sanitary wastes pumped via underground pipes from the former Hangar 2, which was used for the storage and maintenance of military dirigibles (blimps). Given the use of the former hangar, there were initial concerns that the Tile Leach Field may have received gasoline, other fuels, and potentially battery acid via the hangar's sewer system. For this reason, the Tile Leach Field was one of the sites originally

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Part 3—Responsiveness Summary

studied under the 1991 Site Investigation (SI). The 1991 SI report recommended that no further investigations into the nature and extent of contamination be conducted at the Tile Leach Field because there was no evidence that hazardous substances had been disposed of at the site. However, based on discussions between the Navy, EPA, and MADEP, additional study was warranted to support regulatory concurrence with Navy decisions on the site. Therefore, the Tile Leach Field was retained for inclusion in the CERCLA Remedial Investigation (RI), along with the other seven sites investigated under the Installation Restoration Program. The RI provided a detailed site assessment, including both an ecological risk assessment and a human health risk assessment. Results of these assessments revealed no significant risks. Under CERCLA, if risks do not exceed regulatory thresholds, then no action is required.

Comment 2 - During the two phases of detailed remedial investigation carried out between 1996-2002, what exactly changed?

Response – The Phase I remedial investigation covered the initial six operable units (OUs), including Tile Leach Field, collected a limited number of samples, and identified data gaps. The Phase II RI focused exclusively on Tile Leach Field and provided a detailed site assessment, filling in gaps identified in the Phase I RI and providing both an ecological risk assessment and a human health risk assessment. Since there have been no base activities at the Tile Leach Field since 1996, no changes have occurred at the site between 1996 and 2002. Rather, changes have occurred in the volume of data and assessments in the investigations.

Comment 3 - In performing the "Human Health and Ecological Risk Assessment" had the Navy been provided and used the EPA updated announcement that it had been established that; "Children are now found to be up to 10x more susceptible to adverse health effects from many toxic substances"? If the Navy hasn't been given an updated method of risk assessment does the Navy truly believe Public Health is not at risk?

Response – The Tile Leach Field risk assessments utilized the most up to date toxicity data, exposure assumption parameters, and methods available from EPA. The risk assessment process was detailed in the Phase II RI Work Plan, which was reviewed and approved by EPA and MADEP, as was the Phase II RI Report. Risk assessment methods, while generally available since 1989, have been continually updated and refined since that time. EPA is responsible for reviewing new chemical-specific toxicity data, exposure information, and risk assessment methods as they become available. Once such new information is available, it is reviewed by EPA and the scientific community, and if approved is incorporated into EPA guidance, publications, and databases. The techniques and assumptions for dermal risk assessment, for example, have been recently updated and new guidance was finalized in 2004. Prior to the final version of the guidance, draft versions were available and used in the Phase II RI for Tile Leach Field.

Comment 4 - As Lead Agent in this BRAC process I would assume the Navy to be responsible for insisting all the latest sound science is incorporated into the process.
Am I correct in coming to this logical conclusion?

Response – Navy is responsible for the BRAC process. Navy relies on EPA's and MADEP's expertise during consultation with the Navy to determine what the latest sound science is for use in environmental investigations.

Comment 5 - The Navy has certainly, by myself many times, been made aware of the developing science that is proving the neuro-toxic effects of manganese, among other metals found in what are elevated levels in the Tile Leach Field.

Record of Decision
Naval Air Station South Weymouth
Part 3—Responsiveness Summary

Has the Navy considered the elevated occurrence of neurological disease in proximity to the base (presented for their attention, by myself on many occasions), as something to be considered in tandem with the aforementioned neuro-toxic effects of elevated manganese in the Tile Leach Field.

Response – Navy is aware of “developing science”, however, until such science is peer reviewed and accepted, it would be inappropriate to use it as fact. Navy has followed EPA guidance in the preparation of these investigations. Epidemiologic studies are not part of the human health risk assessment process and are outside the scope of the environmental investigations. Navy is aware of MDPH on-going studies of the occurrence of neurological disease in proximity to the base and will be interested to hear of any final results when they are available.

Comment 6 - As Lead Agent in the BRAC process is the Navy comfortable in taking full responsibility for conducting Human Health Risk Assessments without some faction of the involved agencies assuring that risk assessment is being conducted with currently existing scientific data?

Response – As noted in the Response to Comment 3, Navy has conducted the risk assessment using current science as overseen and approved by EPA and MADEP. EPA has provided assurance that the risk assessment is being conducted with currently existing scientific data.

Comment 7 - How does the Navy explain the logistics behind establishing “Background Levels” used as “naturally occurring benchmarks” in comparative analysis, when these background levels are being collected directly on the base, where they have been subject to decades of military exercises and aviation toxins?

Response – Background Levels are defined as chemicals or concentrations of chemicals present in the environment due to naturally occurring geochemical processes and sources, or to human activities not related to specific point sources or source releases. Background levels are used for comparison and discussion purposes. Metals present at the Tile Leach Field at levels below background concentrations were eliminated from further risk calculations. In contrast, Benchmark Screening Levels are human health risk-based concentrations, which have been developed by EPA to reflect levels of contaminants considered protective of human health. Benchmark screening levels were used as an initial screening tool in Tile Leach Field risk assessment to eliminate low toxicity, low concentration contaminants from further risk calculations.

The NAS South Weymouth basewide background levels used at the Tile Leach Field have been prepared in accordance with MADEP and EPA guidance and have been reviewed by both regulatory agencies. Navy collected background samples from locations on the base where there was no historical or visual evidence of past human activities. Environmental professionals from the Navy, its subcontractors, the EPA, and MADEP were actively involved in the selection of sampling locations, oversight of sampling methods, laboratory analytical methods used, and statistical analysis of the data. Refer to the Final Summary Report of Background Data Summary Statistics for NAS South Weymouth, Stone and Webster, February 2000, and the supplement to the final report, November 2002, for a complete discussion of the methods used to determine background samples and the final determination of background levels for each analyte. This document is available at the Navy's Caretaker Site Office and in the public repositories identified in Part 1 of this ROD.

The NAS South Weymouth soil background levels for polycyclic aromatic hydrocarbons (PAHs) and metals are generally comparable to Massachusetts soil background concentrations. The MADEP has produced a technical update regarding background levels of PAHs and metals in soil, which is included as Appendix G to this ROD. PAHs are ubiquitous in the environment and are formed by the incomplete burning of organic material, including wood, coal, oil, gasoline, and from forest fires. They are also found in crude oil, coal tar, creosote, and asphalt. Metals are both naturally-occurring and found in man-made materials widely distributed in the environment. Also included in Appendix G is a tabular comparison of NAS South Weymouth soil background values with background values published by MADEP.

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In addition to PAHs and metals, pesticide compounds were detected in background surface soil, subsurface soil, sediment, groundwater, and surface water samples. Pesticides were routinely applied throughout the NAS SOWEY facility and were likely used in surrounding neighborhoods, consistent with their intended purpose. As such, their presence in background sampling locations is expected. The background pesticide concentrations, although not used for quantitative, risk-based screening, are useful in assessing whether site-specific pesticides are present at a particular site in concentrations that are higher than background conditions, which may indicate that they are attributable to site-related activities.

A single PCB compound (Aroclor 1260) was detected in one basewide background sediment sample. PCBs are not expected in background conditions. PCB presence in this single background location is likely attributable to an isolated source, and is not considered representative of background conditions. Background PCB concentrations were not used for quantitative, risk-based screening.

Comment 8 - As appointed "Lead Agent" in this BRAC process does the Navy assume full responsibility for establishing this logically irresponsible method of collecting "naturally occurring" data benchmarks?

Response – The Navy is responsible for planning and carrying out the collection of background samples, reviewing the data, and preparing comparisons of the background data set to site data. It is EPA's and MADEP's responsibility to review the process and the data, to recommend changes if needed, and to approve the final information. As stated in the Response to Comment 7, risk-based Benchmark Screening Levels are developed by EPA.

Comment 9 - What efforts are enforced by the Lead Agent, in this case the Navy, to assure the computations used in the establishment of Human Health Risks, are truly protective of human health, given currently recognized facts?

Response – The Navy has used reasonable maximum exposure assumptions in a maximum exposure scenario (a residential scenario including use of groundwater at the site as drinking water, even though future residential use of the property is not allowed in the current zoning plan and the groundwater is not within a potentially productive aquifer) to assure the computations used in the establishment of Human Health Risks, are overprotective of human health.

Comment 10 - Realizing the possibility for any Leech Field to fail, how has the Navy established the surety to define this site as ".3" acres? I would assume the Navy led efforts to test for substances of concern, far beyond this third of an acre. How far beyond this small former CERCLA site was data collected and analyzed?

Response –The Tile Leach Field site has been defined as the area covered by the distribution lines and leach field. Navy policy is to start at the source zone at each site and then move outward to determine the extent of contamination. As indicated in Figure 2-4a in Part 2 of this ROD, a series of six test pits and one boring were installed along the western edge of the site, where potential contamination may have migrated toward French Stream. Additional soil samples were collected approximately 30 feet north and south of the site boundaries. Co-located surface water and sediment samples were collected from 80 feet upstream of the site to 450 feet downstream of the site. In the 2005 groundwater investigation, samples were collected within the site border, 450 feet downgradient (south) of the site, 100 feet northwest of the site, and 400 feet north of the site.

Comment 11 - How does the Navy explain the logistics behind "closing out with No Action necessary" the Tile Leach Field when it sits directly between the still-designated CERCLA site West Gate Landfill amongst others, and the poisoned, lifeless Frenches Stream that continues to flow through our neighborhoods? What efforts were made to test the referred to "adjacent wetlands". Has the pooling distribution of contaminants in wetlands" found by the USGS study off base on Old Swamp River, been considered in wetlands associated with the Tile Leach Field?

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Explain the logistics behind closing out a small site, downstream from a number of still unclosed sites, and upstream, directly beside and on top of Frenches Stream (and associated former runway drainage ditches), which are tied together hydro-geologically and geographically to the true flow of Frenches Stream, a headwater of the North River Watershed? Unless "the total number of closed sites" is being politically used as some kind of bargaining chip, it makes no sense to me. Does the Navy believe there to be no possibility of again contaminating this area when the remediation of the West Gate Landfill is undertaken?

Response – The Tile Leach Field site may be closed with no action because the assessments of potential human and ecological exposures to the soil and groundwater at Tile Leach Field found no unacceptable risks. The intent of closing the Tile Leach Field site is to rule out this site as a potential source for contamination at the base and to focus further efforts on remaining sources elsewhere on the base. The close-out of the Tile Leach Field does not affect surrounding parcels. Other potential sources of contamination are being addressed separately under other operable units and other programs. Any potential future contamination of the Tile Leach Field, which may result from migration of contaminants from other sources to or toward the Tile Leach Field parcel, will be addressed under those other sites. For example, groundwater at the Pistol Range site, which was attributed to the Solvent Release Area site, is being addressed in the Solvent Release Area Remedial Investigation, despite the fact that the Pistol Range Site is closed. The "adjacent wetlands" were addressed under the Tile Leach Field through surface water and sediment sampling. Contaminant concentrations found in the stream were not attributed to Tile Leach Field since these contaminants were not found in Tile Leach Field soil and groundwater. For this reason, the French's Stream, as well as the Old Swamp River will be included in the Basewide Watershed Assessment to be included in the basewide assessment.

Comment 12 - Is the Navy making full use of the EPA and USGS expertise in hydrogeology?

Response – The Navy and EPA both have hydrogeologists on staff and utilized consultant hydrogeologists on this project. An EPA hydrogeologist reviewed the work and reports generated for this site. USGS has not been directly involved in this site, however, hydrogeologists from Navy, EPA, and consultants use USGS guidance as a matter of standard practice.

Comment 13 - Has testing along the full length of these porous clay pipes been warranted? What work if any has been conducted around the northerly "distribution box" area?

Response – The porous clay pipes located in the leach field downstream of the distribution box were tested by assessing the underlying soil and groundwater. Testing along the full length of the of the non-porous sanitary distribution pipes north (upstream) of the distribution box has not been done and is not warranted based on the conclusions of a video survey. The video survey indicated that the pipes were intact and in good condition; therefore, the location with the highest potential for contamination (the source area) was around the porous clay pipes downstream of the distribution box (the Tile Leach Field). As the source area had a determination of no significant risk, there was no reason to test the entire length of the sanitary line.

Comment 14 – The proposed plan discusses a Volatile Organic Compound 1,4-dioxane in one groundwater sample during the Remedial Investigation, but in 2005 retest was not detected. Is this an instance of biodegradation or an example of migration?

Response – 1,4-dioxane was detected in one upgradient groundwater sample during the Remedial Investigation at a concentration close to the detection limits of the laboratory instrument. This data was qualified and the data for the other wells was rejected due poor instrument response, e.g. the instrument used had trouble detecting a known standard of 1,4-dioxane. The retests in 2005 used a more accurate method with a better (lower) detection limit. It was expected that if the initial concentration as reported was actually present in the groundwater, the more accurate testing would confirm it. Instead, 1,4-dioxane was not detected using the more accurate testing in 2005. If 1,4-dioxane had been present and any

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migration had occurred in the interim period, residual 1,4-dioxane would have still been seen in the initial well and would have also appeared in downgradient wells in 2005. Biodegradation would also have left some residual level of 1,4-dioxane in the original location. This was not the case, indicating that the earlier laboratory result had been a false positive.

Comment 15 – The Proposed Plan admits finding “5 different Polycyclic Aromatic Hydrocarbons (PAHs) in surface soil during initial Remedial Investigations. This was expected as “these substances were also found in background samples”. Four different PAHs were found in subsurface soil. Still others were found at “relatively low concentrations”. Would the Navy explain “relative” to what? If I was to take soil samples away from proximity to the base, is it likely I would find such substances? In what ways do these substances become “naturally occurring”?

Response – Five different semi-volatile organic compounds (SVOCs) including four PAHs and one phthalate were detected in surface soil in the 1996 Phase I Remedial Investigation. Four different SVOCs including one PAH and three phthalates were detected in subsurface soil in the 1996 Phase I and 1999 Phase II Remedial Investigations. The PAHs and the phthalates were detected at relatively low concentrations at or near laboratory quantitation limits. PAHs are ubiquitous compounds. They occur both naturally and as the result of human activity as combustion products. They are present both in urban areas and in relatively pristine areas where historic burning (forest fires, brush fires, clearing by early settlers, etc.) has occurred. See the discussion of background concentrations in the Response to Comment 7 and the associated table in Appendix F. Phthalates are common plasticizers added to polyvinyl chloride (PVC) to make it more elastic and can readily leach out of PVC products. They are often identified in laboratory QA samples.

Comment 16 – In addressing the subject of increased pesticides in surface soil and sediments, the Navy states although dieldrin and gamma-chlordane both exceed collected “naturally occurring Background Levels”, However, the “types, concentrations, and distributions indicate their presence in the soil as a result of surficial application for insect control”. So levels found are O.K for CERCLA law? Do branches of the DOD share any type of immunity from pesticide usage controls? Did the Navy keep records of pesticide usage on SWNAS? Is there any concern here?

Response – The Proposed Plan states that dieldrin and gamma-chlordane “were present at concentrations that exceeded background levels”. Background levels of pesticides are not naturally occurring; rather, they are the result of human activity independent of base activities. The statement “the types, concentrations, and distributions indicate that they are present in the soil as a result of routine surficial application for insect control” was included to provide an explanation of the source of these contaminants. The levels present are “okay” for CERCLA because they did not produce an unacceptable risk. Branches of the DOD do NOT have any type of immunity from pesticide usage controls. No records of pesticide usage at NAS South Weymouth are available. Since calculations showed no risks, there is no reason for concern regarding detected pesticide concentrations.

Comment 17 – In discussing “Inorganic” substances associated with the Tile Leach Field, the Navy states in their Proposed Plan that “Most were within background levels (which as previously noted I find irresponsible in all regard). Noted exceptions include the metals Manganese and Aluminum, which were found at elevated levels in both sediment and surface water “both upstream and downstream”. Admitting this connectivity of remediation needs, as well as the required completion of the long-in-coming Basewide Watershed Assessment, how does the Navy briefly explain the overall logistics of their Southwest quadrant base cleanup plan?

Response – Please see the Responses to Comments 7 and 8 for a discussion of background issues and the associated table in the Appendix F. Since metals present upstream of the Tile Leach Field, the Tile Leach Field is not the likely source of metals in the stream. Aluminum, iron, and manganese were called out in the RI as metals detected in soil, sediment, groundwater, and surface water exceeding background levels in one or more media and exceeding ambient water quality criteria. These three metals were

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included in the ecological risk assessment for surface soil and surface water and both iron and manganese were included in the ecological risk calculations for sediment. The ecological risk assessment found no significant risks. Iron as an essential nutrient is not evaluated in human health risk assessment. Aluminum was included in the human health assessments of surface soil. Manganese was included in the human health assessments of surface water. The human health risk assessment found no significant risks. As stated previously, the stream surface water and sediment will be included in the basewide assessment. This ROD deals specifically with Tile Leach Field and thus does not discuss the basewide assessment.

Comment 18 – Regarding my previously mentioned Manganese concerns, I would have to say that the Lead Agent in this BRAC process should do anything in their power to prohibit further dispersion of elevated levels of a now known neuro-toxic substance from continuing to leech into the environment. The Navy proposed method of “no further action” appears irresponsible to me. Of course, as mentioned, I’m a man with a serious neurological disorder, and frankly sometimes I don’t think straight. I have friends that would be quick to point out I could never think straight. Please attest that the Navy is rightly thinking.

Response – The effects of manganese on the central nervous system were the basis for the evaluation of human health effects of manganese in surface water in the risk assessment. The concentrations of manganese found at the Tile Leach Field were not at levels high enough to produce an administered dose greater than a reference dose established as safe based on human ingestion studies. Although a contaminant may be present at concentrations above background concentrations, that contaminant concentration is not necessarily a concern. The concentration must be combined with exposure information and information on its toxicity as determined by sound and supportable accepted scientific study to determine if the contaminant is present at sufficient levels to affect human health. It should also be noted that the effects of manganese on the central nervous system are the basis for the screening values used in the human health risk assessment of surface soils.

Comment 19 – In addressing the subject of PCB’s, the Navy claims to have found Aroclor-1260 in a sample taken 400’ from the site at a concentration of 640 ug/kg where Background samples were only 230 ug/kg. Does the Navy Lead Agent believe that this “naturally occurring” Background level of Aroclor-1260 to be a level of PCB conducive of protecting Public Health?

Response – Background levels of PCBs are not naturally occurring. The sediment Aroclor 1260 concentration of 640 µg/kg was used in the human health risk assessment as the exposure point concentration for PCBs in sediment. Resulting risks were within acceptable limits. Therefore, it can be concluded that both the “site” 640 ug/kg sediment concentration and the lower sediment background level of 230 µg/kg are protective of human health. Note that the established cleanup level for PCBs in soil (a typically more intense exposure scenario than sediment) for residential properties is 1,000 ug/kg. Under a residential soil exposure scenario 640 ug/kg of Aroclor 1260 would correspond to a cancer risk level of 3 per 1,000,000. This risk level assumes the receptor is exposed to this level on a regular and on-going basis at their home. 3 in 1,000,000 is considered an acceptable risk level by both EPA and MADEP.

Comment 20 – Is the Navy Lead Agent fully responsible for establishing and approving these “naturally occurring” benchmarks?

Response – Please see the Responses to Comments 7 and 8 for a discussion of background issues. Navy is responsible for establishing naturally occurring background levels and background levels due to human activities not related to specific point sources or source releases with oversight and approval of EPA and MADEP. As stated in the Response to Comment 7, risk-based Benchmark Screening Levels are developed by EPA.

Comment 21 – The Navy finds “IT IS LIKELY that the AROCLOR-1260 is from an offsite source”. By saying “offsite source” is the Navy referring to off the 3rd of an acre Tile Leach Field?

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Response – Yes, by saying “offsite source” the Navy is referring to a source outside the 0.3-acre Tile Leach Field. As mentioned in the Proposed Plan, the Aroclor 1260 in the sediment sample downstream of the site could be associated with the TACAN outfall. PCBs and other chemicals in the TACAN ditch have been addressed in a removal action. The PCB sediment data will be considered along with other existing data in the basewide assessment.

Comment 22 – Having some familiarity with the Southwest quadrant of the base via my stumbling upon at times opened holes in the fence, I had always marveled at what seemed to be strange man-made little hillocks in the area now overgrown with brush and young trees. Has the Navy explored the possibility that these geological mysteries could in fact be historical dumping grounds for things like old transformers capable of spreading PCBs in the environment? What action did the Navy take to this PCB contaminated site 400’ away from the Tile Leach Field?

Response – In the immediate vicinity of the Tile Leach Field, the uneven topography may be attributable to site investigation activities (test pits) and the extensive cut, fill, and borrow earth moving construction operations that occurred during the runway development projects. Other areas outside the immediate vicinity of Tile Leach Field are outside the purview of this OU but have been addressed under the Environmental Baseline Survey program. Transformers have not been discovered at or in the vicinity of the Tile Leach Field. As discussed in the Response to Comment 19 above, the sediment Aroclor 1260 concentration of 640 µg/kg was used in the human health risk assessment for the Tile Leach Field as the exposure point concentration for PCBs in sediment. Resulting risks were within acceptable limits. The PCB sediment data will also be considered along with other existing data in the basewide assessment.

Comment 23 – After having the experience recently with the “Antennae Field” (what was RIA008 I believe...), wouldn’t the Navy be responsible for expanding a study around large hits of PCBs? As I remember it, at the “Antennae Field” the original removal action of 230 cubic feet of contaminated soil, became a thousand cubic feet of contaminated soil, and another thousand, and another thousand, and another thousand, I don’t really know where it stopped. Is the Navy completely confident that this PCB find is not of this ilk?

Response – Since the single detected concentration of PCBs in sediment at the Tile Leach Field was below the most stringent cleanup goal; however, the PCB sediment data will also be considered along with other existing data in the basewide assessment.

Comment 24 – Before briefly addressing the additional Areas of Concern I would like to ask one more question of the Navy as regards the closing of the Tile Leach Field Superfund site.

Where the Plan cites “Community Acceptance of the Proposed Plan”, following the public comment period, is anything different with this site from the already closed “Rubble Disposal Area” Superfund site? A complete lack of “Public Acceptance” with that site meant nothing.

A toxic landfill was capped beside a source of Weymouth Drinking Water regardless of all public opinion. How is it that the Proposed Plan cites “Community Acceptance” as a step in the closing of this particular site?

Response – The 30-day comment period is established to solicit community comments on the Navy’s proposed decision for the Tile Leach Field. Comments received from the public are addressed in this Responsiveness Summary, as Part 3 of the ROD for the Tile Leach Field. It is not appropriate to address other OUs within this ROD. Navy and EPA will have considered all comments from the public in the decision to close the Tile Leach Field site with no action. As noted in Section II of this Responsiveness Summary, the comments received on the Tile Leach Field Proposed Plan do not necessitate a change from the No Action proposal.

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Comment 25 – It is mentioned in the Proposed Plan for closing out the Tile Leech Field Superfund site that the Navy is fulfilling its' responsibility to Public Participation to release and accept these public comments regarding the "No Further Action" decision. The plan further states that "The Navy is required by law to provide written responses to formal comments received on this Proposed Plan".

Will the Navy let me know if I've in any way failed to create "formal comments" to specification, as I'm still awaiting answers to my timely submitted comments on a number of other issues, my FOST4 comments as example. Those unanswered comments have direct impact on the comments I'll now make regarding the closing AOCs that I will now speak about. Having received no answers to those long ago submitted concerns further dilutes my public participation in this process. How does the Navy disagree with that statement? Does the Lead Agent Navy believe it is doing justice to the Public Process? Please explain how in any way that is possible?

Response – These responses serve as the required written responses to your formal comments on the Tile Leach Field No Action Proposed Plan. FOST4 is currently on hold because of changes to the development plan. All previously submitted FOST4 comments will be addressed when FOST4 is reactivated.

The remaining comments below will be addressed in the Responsiveness Summary (Part 3) of the AOC 3, 13, 15, and 100 ROD.

AOC03

I am including these AOC concerns along with the Tile Leech Field comments, as many of those general questions presented regarding the Tile Leech Field, also apply to these Areas of Concern. I am addressing this entire combined Public Comment to both Dave Barney and Mark Leipert, who I trust between them will address my concerns.

The Proposed Plan refers to the TACAN Outfall as a possible source of the PCB at the closing out Tile Leech Field Superfund site.

The TACAN Outfall is one of three Areas of Concern the Navy has currently out for Public Comment in plans to close out as "No Further Action".

As noted in the questions I posed for the Tile Leech Field, I can't understand the logistics of closing out this AOC as the TACAN Outfall is a downstream receptor of a number of the Navy's concerns.

Does the Navy think continued remediation of the upgradient "Solvent Plume", the continued work on the "Jet Fuel Pipeline" and the "Hangers" drainage will have no effect on recontaminating the "TACAN Outfall"?

I would have the Navy explain how that is possible, to eliminate my concern that the closing out AOCs and CERCLA sites taking place enmasse at SWNAS, is not being pushed along by attempts to make numbers look good politically. Please explain how the Navy will be keeping this collected drainage site clean from northerly pollutants?

What two metals exceeded "benchmark screening levels".

Please make public the names of the two metals and their concentrations found in the TACAN Outfall area within medium type, as well as associated "benchmark screening levels" and associated "background levels".

Please explain how background levels and benchmark screening levels are defined in conjunction with one another?

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Please provide me with the computation along with any other considerations factored in, used to establish an "unacceptable risk to human health". Does the Navy as appointed "Lead Agent" accept full responsibility for the current design of this computation?

General Concerns cited with the Tile Leach Field Proposed Plan regarding the establishment of "naturally occurring" Background Levels, elevated Neurotoxins (such as Manganese) and the validity of Public Participation in the BRAC apply to these AOCs as well.

AOC100

I will not bother to address any more specifics with the four closing AOC's, except one, regarding AOC100.

This is one asked a number of times at RAB meetings, but I have still yet to receive clarification.

Having earlier admitted to trespassing within the woods along Frenches Stream in the southwest section of the base, up and down the fence line in adjacent woods and wetlands, I am sure to have stumbled through this area a number of times from 1984-2000.

Having fallen sick with a disease (MS) that a growing majority of scientists believe has an environmental trigger element, I have been very interested in contaminants found at this particular AOC, due to my 16 year close exposure to this site while out enjoying nature on weekly walks.

Having been told that high levels of the metal Chromium was found there, I would like the Navy to present a more complete picture of the contaminant levels found there, including metals that forced the removal action.

I would also appreciate the Navy breaking out the Chromium by type, most important of course the percentage of total Chromium to be of the Hexavalent variety.

I would ask the Navy to also provide the levels of metals remaining after the AOC100 removal action in all media.

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**APPENDIX A: MASSACHUSETTS DEPARTMENT OF ENVIRONMENTAL PROTECTION
LETTER OF CONCURRENCE**

Refer to attached copy.



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
DEPARTMENT OF ENVIRONMENTAL PROTECTION
ONE WINTER STREET, BOSTON, MA 02108 617-292-5500

MITT ROMNEY
Governor

KERRY HEALEY
Lieutenant Governor


STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

April 27, 2006

Mr. Robert Varney, Administrator
Region 1
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100
Boston, MA 02114-2023


Re: Record of Decision
Tile Leach Field Site
Former South Weymouth NAS
MassDEP RTN 3-2621


Dear Mr. Varney:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed *Record of Decision, Operable Unit 5, Tile Leach Field, Naval Air Station South Weymouth*, received electronically on March 24, 2006. The Record of Decision (ROD) summarizes the results from the remedial investigation and the results from a post-risk assessment groundwater sampling event conducted to assess the potential presence of the volatile organic compound 1,4-dioxane, and provides the Navy's rationale for selecting a No Action decision. Based on the results from the remedial investigation, which indicated that current conditions at the site do not pose a significant risk to human health or the environment, and the results from the post-risk assessment groundwater sampling event, which confirmed the site is not a source of 1,4-dioxane, MassDEP concurs with the No Action decision for the Tile Leach Field site.

If you have any questions or comments, please contact David Chaffin, Project Manager (617 348-4005), or Anne Malewicz, Federal Facilities Section Chief (617 292-5659).

Very truly yours,


Robert W. Golledge, Jr. Commissioner
Massachusetts Department of Environmental Protection



Mr. Robert Varney

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April 27, 2006

CC: D. Barney, USN-S. Weymouth
P. Marajh-Whittemore, USEPA
Executive Director, SSTDC
RAB Members
J. Felix, MassDEP-Boston

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APPENDIX B: REFERENCES

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APPENDIX C: GLOSSARY

Background Level—Chemicals or concentrations of chemicals present in the environment due to naturally occurring geochemical processes and sources, or to human activities not related to specific point sources or site releases.

Benchmark—Concentration of a chemical considered to be protective of human health or the environment.

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)—A federal law passed in 1980 and amended in 1986 by the Superfund Amendments and Reauthorization Act. The Act created a special tax that goes into a Trust Fund, commonly known as Superfund, to investigate and clean up abandoned or uncontrolled hazardous waste sites. Navy compliance with CERCLA/Superfund Amendments and Reauthorization Act (see Installation Restoration Program definition) is funded by the Department of Defense under the Defense Environmental Restoration Act.

Chemical of Potential Concern (COPC)—A compound or element identified as a possible source of risk, based upon a comparison between the chemical concentration and established screening levels.

Environmental Baseline Survey (EBS)—An environmental assessment conducted by the Navy at bases that have been closed under the Base Realignment and Closure (BRAC) Act.

Excess Lifetime Cancer Risk Range—Upper bound probability of an individual developing cancer as a result of a lifetime of exposure to a particular level of a potential carcinogen. The predicted cancer risk level is compared against an acceptable range of 1×10^{-4} to 1×10^{-6} .

Hazard Index—A measure of the potential for toxic (non-cancer related) effects from exposure to non-carcinogenic chemicals. A Hazard Index of 1 or less is considered an acceptable risk level by the U.S. Environmental Protection Agency.

Installation Restoration Program—A component of the Defense Environmental Restoration Act created under CERCLA regulations and funded by the Department of Defense. The purpose of the Program is to identify, assess, characterize, and clean up or control contamination from past hazardous waste disposal operation and hazardous material spills at military activities.

Leach Field – A subsurface, porous pipe-and-gravel system that treats (filters and biodegrades) and disposes of sanitary waste water.

National Priorities List—U.S. Environmental Protection Agency's list of sites for priority cleanup under the Superfund program.

Operable Unit—Operable units are site management tools that define discrete steps toward comprehensive actions, based on geographical portions of a site, specific site problems, initial phases of action, or any set of actions performed over time or concurrently at different parts of the site.

Polycyclic Aromatic Hydrocarbons (PAHs)—Chemical compounds such as benzo(a)pyrene, naphthalene, anthracene, and phenanthrene, which are usually byproducts of incomplete combustion. PAHs can occur naturally (i.e. from forest fires) and as the consequence of human activities.

Proposed Plan—A CERCLA document that summarizes the lead agency's (in this case, the Navy's) preferred cleanup remedy for a site and provides the public with information on how they can participate in the remedy selection process.

Record of Decision
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Record of Decision (ROD)—A legal, technical, and public document under CERCLA that explains the rationale and final cleanup decision for a site. It contains a summary of the public's involvement in the cleanup decision.

Remedial Investigation—A step in the CERCLA process that includes a summary report of the information collected to characterize the nature and extent of contamination at a site and determine whether or not the contaminants present a significant risk to human health and the environment at the CERCLA site.

Responsiveness Summary—A CERCLA document containing the responses to the formal comments submitted by the public regarding the Proposed Plan. This summary is issued as an appendix to the ROD.

**Record of Decision
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APPENDIX D: ADMINISTRATIVE RECORD INDEX

| File No. | Vol. | Document No. | Document Type ^(a) | Document Title | Document Date | Document Author | Document Recipient | Document Location | Operable Unit |
|---|------|--------------|------------------------------|---|---------------|-------------------------------------|-----------------------------|-------------------|----------------------------|
| 1.0 SITE ASSESSMENT | | | | | | | | | |
| 1.2 Preliminary Assessment | | | | | | | | | |
| 1.2 | | 1.2-1 | R | Preliminary Assessment, NAS South Weymouth, Massachusetts | 1988 | Argonne National Laboratory | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 1.3 Site Inspection/Investigation | | | | | | | | | |
| 1.3 | | 1.3-1 | R | Work Plan Site Investigation at Naval Air Station South Weymouth, Massachusetts | 3/90 | Baker Environmental Inc. | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 1.3 | | 1.3-2 | R | Site Investigation at Naval Air Station South Weymouth, Massachusetts | 12/91 | Baker Environmental Inc. | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.0 REMEDIAL INVESTIGATION | | | | | | | | | |
| 3.2 Sampling and Analysis Data | | | | | | | | | |
| 3.2 | | 3.2-1 | R | Data Validation Addenda Remedial Investigation South Weymouth, Massachusetts <i>Addenda Volumes I, II, III, IV, V, and VI</i> | 1/97 | Brown and Root Environmental (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.2 | | 3.2-2 | R | Final Summary Report of Background Data Summary Statistics for Naval Air Station South Weymouth, Massachusetts | 2/00 | Stone & Webster | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 3.2 | | 3.2-3 | R | Supplement to Final Summary Report of Background Data Summary Statistics for NAS South Weymouth | 11/02 | Stone & Webster | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 3.6 Remedial Investigation Reports | | | | | | | | | |
| 3.6 | | 3.6-1 | R | Phase I Remedial Investigation, Naval Air Station South Weymouth, Massachusetts Volumes I, II, III, and IV | 7/98 | Brown and Root Environmental (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.6 | | 3.6-2 | R | Turtle Investigation Report for CY 1999 | 4/00 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 3.6 | | 3.6-4 | R | Basewide Groundwater Flow Assessment Phase II Remedial Investigation | 12/00 | Tetra Tech (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |

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| 3.6 Remedial Investigation Reports (continued) | | | | | | | | | |
| 3.6 | | 3.6-8 | R | Turtle Investigation Report for CY 2000 | 4/01 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 3.6 | | 3.6-12 | R | Potential Effects of Elevated pH Values on the Representativeness of Groundwater Samples, NAS South Weymouth (secondary document, supplement to Phase II RI) | 2/02 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |
| 3.6 | | 3.6-13 | R | Phase II Remedial Investigation, Tile Leach Field Area, NAS South Weymouth, Weymouth, Massachusetts (no appendices were reissued) | 5/02 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 5 |
| 3.6 | | 3.6-14 | R | Phase II Remedial Investigation Appendices (AD-A Volumes I & II), TLF, NAS South Weymouth | 12/00 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 5 |
| 3.6 | | 3.6-15 | R | Phase II Remedial Investigation Appendices (Gen-A & RI), TLF, NAS South Weymouth | 12/00 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 5 |
| 3.6 | | 3.6-16 | R | Phase II Remedial Investigation Appendices (HH & ECO), TLF, NAS South Weymouth | 12/00 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 5 |
| 3.6 | | 3.6-17 | R | Field Report, TLF, NAS South Weymouth | 6/05 | Tetra Tech NUS | U.S. Department of the Navy | EFANE | 5 |
| 3.7 Work Plans and Progress Reports | | | | | | | | | |
| 3.7 | | 3.7-1 | R | Final Remedial Investigation Work Plan, NAS Weymouth, Massachusetts | 7/95 | Brown and Root Environmental (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.7 | | 3.7-2 | R | Final Remedial Investigation Work Plan (Phase I) Field Sampling Plan, Quality Assurance Project Plan, Health and Safety Plan Volumes I and II | 11/28/95 | Brown and Root Environmental (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.7 | | 3.7-3 | L | Ecological Technical Memorandum Work Plan, NAS South Weymouth, Massachusetts | 7/98 | Brown and Root Environmental (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |

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| 3.7 | | 3.7-4 | R | Phase II Remedial Investigation Work Plan, NAS South Weymouth, Massachusetts (7 volumes including appendix) | 4/99 | Tetra Tech NUS (ENSR) | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.7 | | 3.7-5 | R | Final Groundwater Sampling Plan, NAS South Weymouth, Massachusetts | 4/05 | Tetra Tech NUS | U.S. Department of the Navy | EFANE | 5 |
| 3.9 Health Assessments | | | | | | | | | |
| 3.9 | | 3.9-1 | R | Public Health Assessment for Naval Air Station South Weymouth, Massachusetts CERCLIS No. MA2170022022 | 3/98 | U.S. Department of Health and Human Services | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.9 | | 3.9-2 | R | Public Health Assessment for Naval Air Station South Weymouth, Massachusetts CERCLIS No. MA2170022022 | 9/99 | U.S. Department of Health and Human Services | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 3.9 | | 3.9-3 | R | Public Health Assessment for Naval Air Station South Weymouth, Massachusetts CERCLIS No. MA2170022022 | 8/30/01 | U.S. Department of Health and Human Services | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 4.0 FEASIBILITY STUDY | | | | | | | | | |
| 4.9 Proposed Plans for Selected Remedial Action | | | | | | | | | |
| 4.9 | | 4.9-2 | R | Proposed Plan, Operable Unit 5-TLF, Naval Air Station South Weymouth, Weymouth, Massachusetts | 8/05 | U.S. Department of the Navy | Public | EFANE | 5 |
| 5.0 RECORD OF DECISION | | | | | | | | | |
| 5.3 Responsiveness Summaries | | | | | | | | | |
| 5.3 | | 5.3-1 | R | Transcript of the Public Hearing on the Proposed Plan for the TLF (included as Appendix E.2 of the TLF Record of Decision) | 11/10/05 | Public | U.S. Department of the Navy | EFANE | 5 |
| 5.4 Record of Decision | | | | | | | | | |
| 5.4 | | 5.4-1 | R | Final Record of Decision Operable Unit 5 TLF (Parts I & II) Naval Air Station South Weymouth, Massachusetts | 11/05 | U.S. Department of the Navy and EPA | Public | EFANE | 5 |

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| 10.0 ENFORCEMENT/NEGOTIATION | | | | | | | | | |
| 10.16 Federal Facility Agreements | | | | | | | | | |
| 10.16 | | 10.16-1 | L | Federal Facility Agreement for South Weymouth Naval Air Station National Priorities List Site | 4/00 | EPA | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.0 COMMUNITY RELATIONS | | | | | | | | | |
| 13.2 Community Relations Plan | | | | | | | | | |
| 13.2 | | 13.2-1 | R | Community Relations Plan Naval Air Station South Weymouth, Massachusetts | 7/98 | U.S. Department of the Navy | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.4 Public Meetings/Hearings | | | | | | | | | |
| 13.4 | | 13.4-1 | | Restoration Advisory Board Workshop Guidebook | 7/94 | EPA | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.4 | | 13.4-4 | | Public Notice: Availability of the Proposed Plan, and Notification of Public Meeting and Comment Period | 10/05 | Tetra Tech NUS | Public | EFANE | 5 |
| 13.4 | | 13.4-6 | | Public Notice: Notification of Restoration Advisory Board Meetings (Monthly) | 1995-2003 | EA Engineering, Science, and Technology | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |
| 13.4 | | 13.4-7 | | Restoration Advisory Board Meeting Minutes (Monthly) | 1995-2006 | U.S. Department of the Navy | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |
| 13.5 Fact Sheets/Information Updates | | | | | | | | | |
| 13.5 | | 13.5-1 | | U.S. Navy Fact Sheet No. 1, NAS South Weymouth | 12/96 | Tetra Tech NUS (ENSR) | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.5 | | 13.5-2 | | The Former Naval Air Station South Weymouth | 2/98 | U.S. Department of the Navy | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.5 | | 13.5-3 | | Environmental Update, NAS South Weymouth | 3/98 | North and South Rivers Watershed Association | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.5 | | 13.5-4 | | Groundwater Flow NAS South Weymouth, Massachusetts | 10/98 | Tetra Tech NUS (ENSR) | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.5 | | 13.5-6 | | Environmental Cleanup Activities NAS South Weymouth Fact Sheet | 4/00 | Tetra Tech NUS (ENSR) | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 13.5 | | 13.5-7 | | Arsenic Information from the Former Naval Air Station South Weymouth, Massachusetts Fact Sheet | 11/01 | Tetra Tech NUS (ENSR) | Public | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |

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| 13.6 Mailing List | | | | | | | | | |
| 13.6 | | 13.6-1 | | Community Relations Mailing List: State, Federal and Local Agencies (including Media and Public Libraries) | N/A | U.S. Department of the Navy | N/A | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |
| 13.6 | | 13.6-2 | | Community Relations Mailing List: Other Parties (e.g., general public) – CONFIDENTIAL (due to potential Privacy Act violations) | N/A | U.S. Department of the Navy | N/A | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |
| 17.0 SITE MANAGEMENT RECORDS | | | | | | | | | |
| 17.6 Site Management Plans and Reviews | | | | | | | | | |
| 17.6 | | 17.6-1 | R | Site Management Plan Naval Air Station South Weymouth, Massachusetts | 10/99 | EA Engineering, Science, and Technology | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 17.6 | | 17.6-2 | R | Site Management Plan Revision 1.0 Naval Air Station South Weymouth, Massachusetts | 10/00 | EA Engineering, Science, and Technology | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9 |
| 17.6 | | 17.6-3 | R | Site Management Plan Revision 2.0 Naval Air Station Weymouth, Massachusetts | 11/01 | EA Engineering, Science, and Technology | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 17.6 | | 17.6-4 | R | Site Management Plan Revision 3.0 Naval Air Station South Weymouth, Massachusetts | 4/03 | EA Engineering, Science, and Technology | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 17.6 | | 17.6-5 | R | Site Management Plan Revision 4.0 Naval Air Station South Weymouth, Massachusetts | 12/04 | EA Engineering, Science, and Technology | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10 |
| 17.6 | | 17.6-6 | R | Draft Site Management Plan Revision 5.0 Naval Air Station South Weymouth, Massachusetts | 8/05 | Tetra Tech NUS | U.S. Department of the Navy | EFANE | 1, 2, 3, 4, 5, 7, 8, 9, 10, 11 |

(a) R = Report; L = Letter.

NOTES: A.R. File = Administrative Record File.
EBS = Environmental Baseline Survey.
EFANE = Engineering Field Activity Northeast
EPA = (U.S.) Environmental Protection Agency.
MADEP = Massachusetts Department of Environmental Protection.
TLF = Tile Leach Field.

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Naval Air Station South Weymouth, Massachusetts
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**APPENDIX E.1: PUBLIC COMMENTS ON THE PROPOSED PLAN FOR THE
TILE LEACH FIELD**

Comments on the Proposed Plan received during the public comment period are attached.

To: David Barney, Remedial Project Mgr South Weymouth Naval Air Station
Consultant for United States Navy BRAC

To: Mark Leipert, Remedial Project Mgr SWNAS
United States Navy
NEFAN, Lester Pa.

From: David Wilmot, RAB Attendee, Abington Naturalist and sick guy

Re: **Comments on Proposed Plan ("No Further Action")**
Operable Unit 5 Tile Leech Field
With further comments on Proposed Plan AOC03, 13, 15, 100 SWNAS

Date: November 04, 2005

I request that the Navy supply a detailed explanation of how it is possible that a site designated as CERCLA, can now be labeled "No Further Action" without any remedial action being done.

What in the 1991 Site Inspection testing done, alerted the Navy that further investigation was warranted?

What test results prior to 1994 when the Tile Leech Field was designated a Superfund site, alerted the Navy to list this site under CERCLA?

During the two phases of detailed remedial investigation carried out between 1996-2002, what exactly changed?

In performing the "Human Health and Ecological Risk Assessment" had the Navy been provided and used the EPA updated announcement that it had been established that; "Children are now found to be up to 10x more susceptible to adverse health effects from many toxic substances"? If the Navy hasn't been given an updated method of risk assessment does the Navy truly believe Public Health is not at risk?

As Lead Agent in this BRAC process I would assume the Navy to be responsible for insisting all the latest sound science is incorporated into the process.
Am I correct in coming to this logical conclusion?

The Navy has certainly, by myself many times, been made aware of the developing science that is proving the neuro-toxic effects of manganese, among other metals found in what are elevated levels in the Tile Leech Field.

Has the Navy considered the elevated occurrence of neurological disease in proximity to the base (presented for their attention, by myself on many occasions), as something to be considered in tandem with the aforementioned neuro-toxic effects of elevated manganese in the Tile Leech Field.

As Lead Agent in the BRAC process is the Navy comfortable in taking full responsibility for conducting Human Health Risk Assessments without some faction of the involved

agencies assuring that risk assessment is being conducted with currently existing scientific data?

How does the Navy explain the logistics behind establishing "Background Levels" used as "naturally occurring benchmarks" in comparative analysis, when these background levels are being collected directly on the base, where they have been subject to decades of military exercises and aviation toxins?

As appointed "Lead Agent" in this BRAC process does the Navy assume full responsibility for establishing this logically irresponsible method of collecting "naturally occurring" data benchmarks?

What efforts are enforced by the Lead Agent, in this case the Navy, to assure the computations used in the establishment of Human Health Risks, are truly protective of human health, given currently recognized facts?

Realizing the possibility for any Leech Field to fail, how has the Navy established the surety to define this site as ".3" acres? I would assume the Navy led efforts to test for substances of concern, far beyond this third of an acre. How far beyond this small former CERCLA site was data collected and analyzed?

How does the Navy explain the logistics behind "closing out with No Action necessary" the Tile Leech Field when it sits directly between the still-designated CERCLA site West Gate Landfill amongst others, and the poisoned, lifeless Frenches Stream that continues to flow through our neighborhoods? What efforts were made to test the referred to "adjacent wetlands". Has the pooling distribution of contaminants in wetlands" found by the USGS study off base on Old Swamp River, been considered in wetlands associated with the Tile Leech Field?

Explain the logistics behind closing out a small site, downstream from a number of still unclosed sites, and upstream, directly beside and on top of Frenches Stream (and associated former runway drainage ditches), which are tied together hydro-geologically and geographically to the true flow of Frenches Stream, a headwater of the North River Watershed? Unless "the total number of closed sites" is being politically used as some kind of bargaining chip, it makes no sense to me. Does the Navy believe there to be no possibility of again contaminating this area when the remediation of the West Gate Landfill is undertaken?

Is the Navy making full use of the EPA and USGS expertise in hydrogeology?

Has testing along the full length of these porous clay pipes been warranted?

What work if any has been conducted around the northerly "distribution box" area?

The proposed plan discusses a Volatile Organic Compound 1,4-dioxane in one groundwater sample during the Remedial Investigation, but in 2005 retest was not detected. Is this an instance of biodegradation or an example of migration?

The Proposed Plan admits finding "5 different Polycyclic Aromatic Hydrocarbons (PAHs) in surface soil during initial Remedial Investigations. This was expected as "these substances were also found in background samples". Four different PAHs were found in subsurface soil. Still others were found at "relatively low concentrations". Would the Navy explain "relative" to what? If I was to take soil samples away from proximity to the base, is it likely I would find such substances? In what ways do these substances become "naturally occurring"?

In addressing the subject of increased pesticides in surface soil and sediments, the Navy states although dieldrin and gamma-chlordane both exceed collected "naturally occurring Background Levels". However, the "types, concentrations, and distributions indicate their presence in the soil as a result of surficial application for insect control". So levels found are O.K for Cercla law?

Do branches of the DOD share any type of immunity from pesticide usage controls? Did the Navy keep records of pesticide usage on SWNAS? Is there any concern here? In discussing "Inorganic" substances associated with the Tile Leech Field, the Navy states in their Proposed Plan that "Most were within background levels (which as previously noted I find irresponsible in all regard). Noted exceptions include the metals Manganese and Aluminum, which were found at elevated levels in both sediment and surface water "both upstream and downstream". Admitting this connectivity of remediation needs, as well as the required completion of the long-in-coming Basewide Watershed Assessment, how does the Navy briefly explain the overall logistics of their Southwest quadrant base cleanup plan?

Regarding my previously mentioned Manganese concerns, I would have to say that the Lead Agent in this BRAC process should do anything in their power to prohibit further dispersion of elevated levels of a now known neuro-toxic substance from continuing to leech into the environment. The Navy proposed method of "no further action" appears irresponsible to me. Of course, as mentioned, I'm a man with a serious neurological disorder, and frankly sometimes I don't think straight. I have friends that would be quick to point out I could never think straight. Please attest that the Navy is rightly thinking.

In addressing the subject of PCB's, the Navy claims to have found Aroclor-1260 in a sample taken 400' from the site at a concentration of 640 ug/kg where Background samples were only 230 ug/kg.. Does the Navy Lead Agent believe that this "naturally occurring" Background level of Aroclor-1260 to be a level of PCB conducive of protecting Public Health?

Is the Navy Lead Agent fully responsible for establishing and approving these "naturally occurring" benchmarks?

The Navy finds "IT IS LIKELY that the AROCLOR-1260 is from an offsite source". By saying "offsite source" is the Navy referring to off the 3rd of an acre Tile Leech Field?

Having some familiarity with the Southwest quadrant of the base via my stumbling upon at times opened holes in the fence, I had always marveled at what seemed to be strange man-made little hillocks in the area now overgrown with brush and young trees. Has the Navy explored the possibility that these geological mysteries could in fact be historical dumping grounds for things like old transformers capable of spreading PCBs in the environment? What action did the Navy take to this PCB contaminated site 400' away from the Tile Leech Field?

After having the experience recently with the "Antennae Field" (what was RIA008 I believe...), wouldn't the Navy be responsible for expanding a study around large hits of PCBs? As I remember it , at the "Antennae Field" the original removal action of 230 cubic feet of contaminated soil, became a thousand cubic feet of contaminated soil, and another thousand, and another thousand, and another thousand, I don't really know where it stopped. Is the Navy completely confident that this PCB find is not of this ilk?

Before briefly addressing the additional Areas of Concern I would like to ask one more question of the Navy as regards the closing of the Tile Leech Field Superfund site.

Where the Plan cites "Community Acceptance of the Proposed Plan", following the public comment period, is anything different with this site from the already closed "Rubble Disposal Area" Superfund site? A complete lack of "Public Acceptance" with that site meant nothing.

A toxic landfill was capped beside a source of Weymouth Drinking Water regardless of all public opinion.

How is it that the Proposed Plan cites "Community Acceptance" as a step in the closing of this particular site?

It is mentioned in the Proposed Plan for closing out the Tile Leech Field Superfund site that the Navy is fulfilling it's responsibility to Public Participation to release and accept these public comments regarding the "No Further Action" decision. The plan further states that "The Navy is required by law to provide written responses to formal comments received on this Proposed Plan".

Will the Navy let me know if I've in any way failed to create "formal comments" to specification, as I'm still awaiting answers to my timely submitted comments on a number of other issues, my FOST4 comments as example. Those unanswered comments have direct impact on the comments I'll now make regarding the closing AOCs that I will now speak about. Having received no answers to those long ago submitted concerns further dilutes my public participation in this process. How does the Navy disagree with that statement? Does the Lead Agent Navy believe it is doing justice to the Public Process? Please explain how in any way that is possible?

AOC03

I am including these AOC concerns along with the Tile Leech Field comments, as many of those general questions presented regarding the Tile Leech Field, also apply to these Areas of Concern. I am addressing this entire combined Public Comment to both Dave Barney and Mark Leipert, who I trust between them will address my concerns.

The Proposed Plan refers to the Tacan Outfall as a possible source of the PCB at the closing out Tile Leech Field Superfund site.

The Tacan Outfall is one of three Areas of Concern the Navy has currently out for Public Comment in plans to close out as "No Further Action".

As noted in the questions I posed for the Tile Leech Field, I can't understand the logistics of closing out this AOC as the Tacan Outfall is a downstream receptor of a number of the Navy's concerns.

Does the Navy think continued remediation of the upgradient "Solvent Plume", the continued work on the "Jet Fuel Pipeline" and the "Hangers" drainage will have no effect on recontaminating the "Tacan Outfall"?

I would have the Navy explain how that is possible, to eliminate my concern that the closing out AOCs and Cercla sites taking place enmasse at SWNAS, is not being pushed along by attempts to make numbers look good politically. Please explain how the Navy will be keeping this collected drainage site clean from northerly pollutants?

What two metals exceeded "benchmark screening levels".

Please make public the names of the two metals and their concentrations found in the Tacan Outfall area within medium type, as well as associated "benchmark screening levels" and associated "background levels".

Please explain how background levels and benchmark screening levels are defined in conjunction with one another?

Please provide me with the computation along with any other considerations factored in, used to establish an "unacceptable risk to human health". Does the Navy as appointed "Lead Agent" accept full responsibility for the current design of this computation?

General Concerns cited with the Tile Leech Field Proposed Plan regarding the establishment of "naturally occurring" Background Levels, elevated Nuerotoxins (such as Manganese) and the validity of Public Participation in the BRAC apply to these AOCs as well.

AOC100

I will not bother to address any more specifics with the four closing AOC's, except one, regarding AOC100.

This is one asked a number of times at RAB meetings, but I have still yet to receive clarification

Having earlier admitted to trespassing within the woods along Frenches Stream in the southwest section of the base, up and down the fence line in adjacent woods and wetlands, I am sure to have stumbled through this area a number of times from 1984-2000.

Having fallen sick with a disease(MS) that a growing majority of scientists believe has an environmental trigger element, I have been very interested in contaminants found at this particular AOC, due to my 16 year close exposure to this site while out enjoying nature on weekly walks.

Having been told that high levels of the metal Chromium was found there, I would like the Navy to present a more complete picture of the contaminant levels found there, including metals that forced the removal action.

I would also appreciate the Navy breaking out the Chromium by type, most important of course the percentage of total Chromium to be of the Hexavalent variety.

I would ask the Navy to also provide the levels of metals remaining after the AOC100 removal action in all media.

**Record of Decision
Naval Air Station South Weymouth, Massachusetts
Appendices**

**APPENDIX E.2: TRANSCRIPT OF PUBLIC HEARING ON THE PROPOSED PLAN
FOR THE TILE LEACH FIELD**

Refer to attached copy.

Proposed Plan
AOC 3, 13, 15 and 100
Tile Leach Field (OU-05)

Public Hearing/Public Comment Period

Naval Air Station
Conference Center
South Weymouth, MA

November 10, 2005
8:00 p.m.

Leavitt Reporting, Inc.

1207 Commercial Street, Rear
Weymouth, MA 02189

Tel. 781-335-6791
Fax: 781-335-7911
leavittreporting@att.net

Hearings • Conferences • Legal Proceedings

1 MR. LEIPERT: I would like to
2 officially open this public hearing. I'd like to
3 welcome everybody to the public hearing for the five
4 sites that we just presented: AOC 3 Suspected TACAN
5 Disposal Area, AOC 13 the Supply Warehouse Railroad
6 Spur, AOC 15 which is the water tower, and AOC 100
7 the East Street Gate Area, and Site 5 Tile Leach
8 Field.

9 Tonight the Navy is proposing no
10 further action for AOC's 3, 13, 15, and 100 and no
11 action for the Tile Leach Field. Tonight you'll
12 have the opportunity to comment on the proposed
13 plans. If you have a comment, we don't have a
14 podium tonight, but somewhere in between the two
15 tables there, we would like you to come up, state
16 your name, spell your name, and then speak slowly,
17 but we won't be responding to your comments tonight.
18 We're just getting it on the record. You'll get the
19 response to your comments in the responsiveness
20 summary which will come out with the ROD.

21 So if anybody has any comments, first
22 of all comment period ends November 24th. I know
23 that's Thanksgiving. So we'll probably give you to

1 Monday after Thanksgiving plus or minus a few days.
2 If you don't feel comfortable stating your comments
3 tonight, you still have time to write them down.
4 You can e-mail them, put them in the mail, send them
5 to us. We'll get them.

6 So does anybody have any comments?

7 MS. PARSON: I'm saving mine for the
8 mail.

9 MR. HAYES: You've done a pretty good
10 job, for the record.

11 MR. LEIPERT: Does anybody else have
12 any comments? If not, I recommend that we close
13 the public hearing at this time.

14 MR. URAN: Second that.

15 MR. LEIPERT: Thank you for coming.
16 Thank you very much for coming.

17 (The hearing closed at 8:15 p.m.)
18
19
20
21
22
23

C E R T I F I C A T E

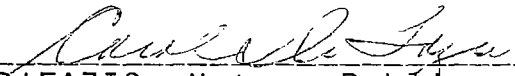
State of Massachusetts)
County of Norfolk) ss.

I, *Carol DiFazio*, a Notary Public in and
for the County of Norfolk, State of MASSACHUSETTS,
do hereby certify:

That the said proceeding was taken before
me as a Notary Public at the said time and place and
was taken down in machine shorthand writing by me;

That I am a Registered Professional
Reporter of the State of Massachusetts, that the
said proceeding was thereafter under my direction
transcribed into computer-assisted transcription,
and that the foregoing transcript constitutes a
full, true, and correct record of the proceedings
which then and there took place;

IN WITNESS WHEREOF, I have hereunto
subscribed my hand and affixed my official seal this
20th day of November, 2005.


CAROL DiFAZIO, Notary Public
Registered Professional Reporter

My Commission expires December 20, 2007
CSR#: 108293

THE FOREGOING CERTIFICATION OF THIS TRANSCRIPT DOES
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**Record of Decision
Naval Air Station South Weymouth, Massachusetts
Appendices**

**APPENDIX F – HUMAN HEALTH RISK ASSESSMENT TABLES
FROM THE PHASE II RI**

TABLE 6-1
COMPARISON OF SCREENING LEVELS - CHEMICALS DETECTED IN
SURFACE SOIL, SUBSURFACE SOIL, SEDIMENT, GROUNDWATER, AND SURFACE WATER
TIF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH MA

| Chemical | FOD | Maximum Detected Concentration | Screening Value (a) | Is Maximum Detect Less Than Screening Value? | Is Chemical a COPC? (k) |
|--------------------------------|-------|--------------------------------|---------------------|--|-------------------------|
| Surface Soil (mg/kg) | | | | | |
| 4,4'-DDE | 2 : 3 | 7.6E-03 | 1.9E+00 | YES | NO-RBC |
| 4,4'-DDT | 3 : 3 | 1.0E-02 J | 1.9E+00 | YES | NO-RBC |
| ALUMINUM | 3 : 3 | 2.0E+04 J | 7.8E+03 | NO | YES |
| BARIUM | 3 : 3 | 1.6E+01 | 5.5E+02 | YES | NO-RBC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 2 : 3 | 7.7E-02 J | 4.6E+01 | YES | NO-RBC |
| CALCIUM | 3 : 3 | 8.6E+02 | EN (b) | EN | NO-EN |
| CHROMIUM | 3 : 3 | 7.6E+00 | 2.3E+01 (c) | YES | NO-RBC |
| CHRYSENE | 1 : 3 | 5.9E-02 J | 8.7E+01 | YES | NO-RBC |
| COBALT | 3 : 3 | 1.7E+00 J | 4.7E+02 | YES | NO-RBC |
| COPPER | 3 : 3 | 5.2E+00 J | 3.1E+02 | YES | NO-RBC |
| ENDRIN ALDEHYDE | 1 : 3 | 1.1E-03 J | 2.3E+00 | YES | NO-RBC |
| FLUORANTHENE | 1 : 3 | 8.1E-02 J | 3.1E+02 | YES | NO-RBC |
| IRON | 3 : 3 | 1.3E+04 J | EN (b) | EN | NO-EN |
| LEAD | 3 : 3 | 1.6E+01 | 4.0E+02 (d) | YES | NO-IEUBK |
| MAGNESIUM | 3 : 3 | 1.1E+03 | EN (b) | EN | NO-EN |
| MANGANESE | 3 : 3 | 1.2E+02 | 1.6E+02 | YES | NO-RBC |
| NICKEL | 1 : 3 | 2.9E+00 J | 1.6E+02 | YES | NO-RBC |
| PHENANTHRENE | 1 : 3 | 4.7E-02 J | 2.3E+03 (e) | YES | NO-RBC |
| PYRENE | 1 : 3 | 7.5E-02 J | 2.3E+02 | YES | NO-RBC |
| SELENIUM | 1 : 3 | 2.0E+00 | 3.9E+01 | YES | NO-RBC |
| SODIUM | 3 : 3 | 7.0E+01 | EN (b) | EN | NO-EN |
| VANADIUM | 3 : 3 | 1.7E+01 | 5.5E+01 | YES | NO-RBC |
| ZINC | 3 : 3 | 2.0E+01 | 2.3E+03 | YES | NO-RBC |
| Subsurface Soil (mg/kg) | | | | | |
| 2-BUTANONE | 3 : 5 | 4.0E-03 J | 4.7E+03 | YES | NO-RBC |
| ALUMINUM | 5 : 5 | 6.4E+03 | 7.8E+03 | YES | NO-RBC |
| AMMONIA | 2 : 2 | 1.1E+01 J | NA | YES | NO-RBC |
| ANTIMONY | 4 : 5 | 3.8E-01 J | 3.1E+00 | YES | NO-RBC |
| ARSENIC | 5 : 5 | 2.4E+00 | 4.3E-01 | NO | YES |
| BARIUM | 5 : 5 | 1.5E+01 / | 5.5E+02 | YES | NO-RBC |
| BENZO(A)PYRENE | 1 : 5 | 7.0E-03 J | 8.7E-02 | YES | NO-RBC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 3 : 5 | 8.2E-02 J | 4.6E+01 | YES | NO-RBC |
| CALCIUM | 5 : 5 | 2.7E+03 | EN (b) | EN | NO-EN |
| CHROMIUM | 5 : 5 | 1.2E+01 | 2.3E+01 (c) | YES | NO-RBC |
| COBALT | 2 : 5 | 6.8E+00 J/J | 4.7E+02 | YES | NO-RBC |
| COPPER | 4 : 5 | 7.7E+00 J | 3.1E+02 | YES | NO-RBC |
| DI-N-OCTYLPHTHALATE | 1 : 5 | 5.1E-02 J | 1.6E+02 | YES | NO-RBC |
| IRON | 5 : 5 | 1.3E+04 | EN (b) | EN | NO-EN |
| LEAD | 5 : 5 | 4.9E+00 | 4.0E+02 | YES | NO-IEUBK |
| MAGNESIUM | 5 : 5 | 2.6E+03 | EN (b) | EN | NO-EN |
| MANGANESE | 5 : 5 | 2.0E+02 J | 1.6E+02 | NO | YES |
| METHYLENE CHLORIDE | 1 : 5 | 2.4E-02 J/J | 8.5E+01 | YES | NO-RBC |
| NICKEL | 5 : 5 | 7.8E+00 / | 1.6E+02 | YES | NO-RBC |
| POTASSIUM | 5 : 5 | 3.2E+02 J/J | EN (b) | EN | NO-EN |
| SODIUM | 3 : 5 | 7.5E+01 J | EN (b) | EN | NO-EN |
| TOLUENE | 2 : 5 | 2.0E-03 J | 1.6E+03 | YES | NO-RBC |
| VANADIUM | 5 : 5 | 1.8E+01 JEB/J | 5.5E+01 | YES | NO-RBC |
| ZINC | 5 : 5 | 3.1E+01 J/J | 2.3E+03 | YES | NO-RBC |
| Sediment (mg/kg) | | | | | |
| 4,4'-DDD | 5 : 5 | 6.7E-02 J | 2.7E+00 | YES | NO-RBC |
| 4,4'-DDE | 3 : 5 | 1.1E-02 | 1.9E+00 | YES | NO-RBC |
| 4,4'-DDT | 2 : 5 | 5.3E-03 J | 1.9E+00 | YES | NO-RBC |
| ACENAPHTHENE | 1 : 5 | 2.0E-01 J | 4.7E+02 | YES | NO-RBC |
| ALDRIN | 1 : 5 | 2.8E-03 J/UJ-- | 3.8E-02 | YES | NO-RBC |
| ALPHA-CHLORDANE | 4 : 5 | 3.3E-02 J | 1.8E+00 (f) | YES | NO-RBC |

TABLE 6-1
COMPARISON OF SCREENING LEVELS - CHEMICALS DETECTED IN
SURFACE SOIL, SUBSURFACE SOIL, SEDIMENT, GROUNDWATER, AND SURFACE WATER
TLF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH MA

| Chemical | FOG | Maximum Detected Concentration | Screening Value (a) | Is Maximum Detect Less Than Screening Value? | Is Chemical a COPC? (k) |
|----------------------------|-------|--------------------------------|---------------------|--|-------------------------|
| ALUMINUM | 5 : 5 | 4.8E+03 | 7.8E+03 | YES | NO-RBC |
| ANTHRACENE | 1 : 5 | 2.4E-01 J | 2.3E+03 | YES | NO-RBC |
| ANTIMONY | 2 : 3 | 8.1E+00 J | 3.1E+00 | NO | YES |
| ARSENIC | 5 : 5 | 6.8E+00 J | 4.3E-01 | NO | YES |
| BARIUM | 5 : 5 | 8.7E+01 J | 5.5E+02 | YES | NO-RBC |
| BENZO(A)ANTHRACENE | 3 : 5 | 9.4E-01 J | 8.7E-01 | NO | YES |
| BENZO(A)PYRENE | 2 : 5 | 7.2E-01 J | 8.7E-02 | NO | YES |
| BENZO(B)FLUORANTHENE | 3 : 5 | 9.5E-01 J | 8.7E-01 | NO | YES |
| BENZO(G,H,I)PERYLENE | 2 : 5 | 4.6E-01 J | 2.3E+02 (g) | YES | NO-RBC |
| BENZO(K)FLUORANTHENE | 3 : 5 | 9.1E-01 J | 8.7E+00 | YES | NO-RBC |
| BERYLLIUM | 3 : 5 | 2.9E+00 J | 1.6E+01 | YES | NO-RBC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 4 : 5 | 1.8E+00 J/J | 4.6E+01 | YES | NO-RBC |
| CADMIUM | 2 : 4 | 1.5E+00 | 7.8E+00 | YES | NO-RBC |
| CALCIUM | 5 : 5 | 2.3E+03 J | EN (b) | EN | NO-EN |
| CARBAZOLE | 1 : 5 | 2.2E-01 J | 3.2E+01 | YES | NO-RBC |
| CHROMIUM | 5 : 5 | 1.7E-01 | 2.3E+01 (c) | YES | NO-RBC |
| CHRYSENE | 3 : 5 | 1.1E+00 J | 8.7E+01 | YES | NO-RBC |
| COBALT | 5 : 5 | 9.8E+00 J | 4.7E+02 | YES | NO-RBC |
| COPPER | 5 : 5 | 4.2E+01 | 3.1E+02 | YES | NO-RBC |
| DIBENZ(A,H)ANTHRACENE | 1 : 5 | 2.8E-01 J | 8.7E-02 | NO | YES |
| DIBENZOFURAN | 1 : 5 | 1.1E-01 J | 3.1E+01 | YES | NO-RBC |
| DIELDRIN | 3 : 5 | 1.9E-02 J/ | 4.0E-02 | YES | NO-RBC |
| DI-N-BUTYLPHTHALATE | 1 : 5 | 1.8E-01 JEB | 7.8E+02 | YES | NO-RBC |
| ENDOSULFAN II | 1 : 5 | 3.1E-02 J | 4.7E+01 | YES | NO-RBC |
| ENDRIN KETONE | 1 : 5 | 6.0E-03 J | 2.3E+00 | YES | NO-RBC |
| FLUORANTHENE | 3 : 5 | 1.6E+00 J | 3.1E+02 | YES | NO-RBC |
| FLUORENE | 1 : 5 | 2.0E-01 J | 3.1E+02 | YES | NO-RBC |
| GAMMA-CHLORDANE | 2 : 5 | 3.0E-02 J | 1.8E+00 (f) | YES | NO-RBC |
| INDENO(1,2,3-CD)PYRENE | 2 : 5 | 5.3E-01 J | 8.7E-01 | YES | NO-RBC |
| IRON | 5 : 5 | 1.1E+05 J | EN (b) | EN | NO-EN |
| LEAD | 5 : 5 | 1.8E+02 | 4.0E+02 | YES | NO-IEUBK |
| MAGNESIUM | 5 : 5 | 1.8E+03 | EN (b) | EN | NO-EN |
| MANGANESE | 5 : 5 | 5.0E+02 J1 | 1.6E+02 | NO | YES |
| MERCURY | 2 : 4 | 1.5E-01 | 2.3E+00 | YES | NO-RBC |
| METHOXYCHLOR | 1 : 5 | 1.2E-02 J | 3.9E+01 | YES | NO-RBC |
| METHYLENE CHLORIDE | 2 : 2 | 3.0E-03 J | 8.5E+01 | YES | NO-RBC |
| NICKEL | 5 : 5 | 1.2E+01 J | 1.6E+02 | YES | NO-RBC |
| PHENANTHRENE | 3 : 5 | 1.4E+00 J | 2.3E+03 (e) | YES | NO-RBC |
| POTASSIUM | 5 : 5 | 2.7E+02 | EN (b) | EN | NO-EN |
| PYRENE | 3 : 5 | 2.1E+00 J | 2.3E+02 | YES | NO-RBC |
| SILVER | 2 : 4 | 4.7E+00 | 3.9E+01 | YES | NO-RBC |
| SODIUM | 4 : 5 | 1.8E+02 J | EN (b) | EN | NO-EN |
| THALLIUM | 3 : 5 | 3.5E+00 J | 5.5E-01 | NO | YES |
| TOTAL PCBs | 1 : 6 | 6.4E-01 | 3.2E-01 | NO | YES |
| VANADIUM | 5 : 5 | 8.6E+01 J | 5.5E+01 | NO | YES |
| ZINC | 4 : 5 | 1.3E+02 J | 2.3E+03 | YES | NO-RBC |
| Groundwater (ug/L) | | | | | |
| 1,4-DIOXANE | 1 : 1 | 1.3E+01 J | 6.1E+00 | NO | YES |
| ALUMINUM | 2 : 6 | 6.9E+03 | 3.7E+03 | NO | YES |
| AMMONIA | 4 : 4 | 2.3E+02 | 2.1E+01 | NO | YES |
| ARSENIC | 1 : 6 | 2.8E+00 J/U- | 4.5E-02 | NO | YES |
| BARIUM | 5 : 6 | 9.2E+01 | 2.5E+02 | YES | NO-RBC |
| CALCIUM | 5 : 8 | 2.8E+04 / | EN (b) | EN | NO-EN |
| CHROMIUM | 1 : 6 | 6.7E+00 J | 1.1E+01 (f) | YES | NO-RBC |
| COBALT | 1 : 6 | 6.4E+00 J | 2.2E+02 | YES | NO-RBC |
| COPPER | 3 : 6 | 9.3E+00 | 1.5E+02 | YES | NO-RBC |
| IRON | 6 : 6 | 1.2E+04 | EN (b) | EN | NO-EN |

TABLE C-1
COMPARISON OF SCREENING LEVELS - CHEMICALS DETECTED IN
SURFACE SOIL, SUBSURFACE SOIL, SEDIMENT, GROUNDWATER, AND SURFACE WATER
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH MA

| Chemical | FOD | Maximum Detected Concentration | Screening Value (a) | Is Maximum Detect Less Than Screening Value? | Is Chemical a COPC? (k) |
|----------------------------|-------|--------------------------------|---------------------|--|-------------------------|
| LEAD | 1 : 6 | 7.4E+00 | 1.5E+01 (h) | YES | NO-RBC |
| MAGNESIUM | 5 : 6 | 3.6E+03 | EN (b) | EN | NO-EN |
| MANGANESE | 5 : 6 | 1.0E+03 | 7.3E+01 | NO | YES |
| POTASSIUM | 3 : 6 | 3.9E+03 J/J | EN (b) | EN | NO-EN |
| SODIUM | 6 : 6 | 1.6E+04 | EN (b) | EN | NO-EN |
| VANADIUM | 1 : 6 | 1.8E+01 J | 2.6E+01 | YES | NO-RBC |
| Surfacewater (ug/L) | | | | | |
| ALUMINUM | 5 : 5 | 2.1E+02 | 3.7E+03 (i) | YES | NO-RBC |
| BARIUM | 5 : 5 | 4.0E+01 | 1.0E+03 | YES | NO-RBC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 1 : 3 | 1.3E+01 J/UJ- | 1.8E+00 | NO | YES |
| CALCIUM | 5 : 5 | 1.3E+04 | EN (b) | EN | NO-EN |
| CHROMIUM | 3 : 5 | 8.1E+00 J | 1.0E+02 (j) | YES | NO-RBC |
| COBALT | 2 : 5 | 5.4E+00 | 2.2E+02 (i) | YES | NO-RBC |
| IRON | 5 : 5 | 6.2E+03 | EN (b) | EN | NO-EN |
| MAGNESIUM | 5 : 5 | 4.5E+03 | EN (b) | EN | NO-EN |
| MANGANESE | 5 : 5 | 6.1E+02 | 5.0E+01 | NO | YES |
| MERCURY | 3 : 3 | 5.8E-03 J/J | 5.0E-02 | YES | NO-RBC |
| POTASSIUM | 5 : 5 | 3.0E+03 | EN (b) | EN | NO-EN |
| SODIUM | 5 : 5 | 2.6E+04 | EN (b) | EN | NO-EN |
| VANADIUM | 3 : 5 | 4.3E+00 /UJ- | 2.6E+01 (i) | YES | NO-RBC |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

EB - equipment blank

EN - essential nutrient

EPA - Environmental Protection Agency

NA - not available

IEUBK - Integrated Exposure Uptake Biokinetic Model for Lead (EPA, 1994a)

NCOPC - not a chemical of potential concern

RBC - Risk Based Concentration. EPA Region III RBC Table, April 13, 2000

mg/kg - milligrams per kilogram

ug/L - micrograms per liter

DDD - dichlorodiphenyldichloroethane

DDE - dichlorodiphenyldichloroethylene

DDT - dichlorodiphenyltrichloroethane

MCL - maximum contaminant level

TCDD - tetrachlorodibenzo-p-dioxin

TEQ - toxicity equivalency quotient

PCBs - polychlorinated biphenyls

FOD - Frequency of Detection. Number of detects; number of beginning samples

WQC - Aquatic Water Quality Criteria, April 1999

/ - Duplicate samples analyzed. Value represents average concentration.

J - Estimated value

J/J - Duplicate samples analyzed, both results are estimated concentration. Value represents average concentration.

U - Non-detect. Value shown is sample quantitation limit.

/U- - Duplicate samples analyzed. Chemical not detected in one sample; half detection limit used in calculating average concentration.

(a) Screening Value - Surface soil, subsurface soil, and sediment screened against EPA Region III

RBCs for residential soil (HI of 0.1 and cancer risk of 10^{-6}). Groundwater screened against EPA

Region III RBCs for tapwater (HI of 0.1 and cancer risk of 10^{-6}). Surface water screened against WQCs for water and organisms. Chemicals lacking WQCs were screened against tapwater RBCs (HI of 0.1 and cancer risk of 10^{-6}).

(b) Chemical is an essential nutrient (EN), and is therefore not a COPC.

(c) The value for Chromium VI was used.

(d) Acceptable concentration of lead in soil predicted by the IEUBK model using EPA default assumptions.

(e) Due to structural similarities, the value for Anthracene was used.

(f) Due to structural similarities, the value for Chlordane was used.

(g) Due to structural similarities, the value for Pyrene was used.

(h) No WQC available. As recommended in WQC guidance, used EPA Drinking Water Advisory MCL, which is based on treatment technology (EPA, 1996).

(i) RBC value used due to lack of WQC value.

(j) No WQC available. Used EPA Drinking Water Advisory MCL, as recommended in WQC guidance.

(k) Inorganics that are consistent with background will be removed from the final COPC list.

20-May-02

TABLE 6-2
COMPARISON OF SITE DATA WITH BACKGROUND
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Are the site data consistent with background? | | | | |
|-----------|---|-----------------|----------|-------------|---------------|
| | Surface Soil | Subsurface Soil | Sediment | Groundwater | Surface Water |
| Aluminum | -- | yes | yes | yes* | yes |
| Antimony | -- | no | --* | -- | -- |
| Arsenic | -- | yes* | --* | --* | -- |
| Barium | -- | yes | yes | yes | yes |
| Beryllium | -- | -- | -- | -- | -- |
| Cadmium | -- | -- | no | -- | -- |
| Calcium | -- | no | yes | yes | no |
| Chromium | -- | yes | no | no | yes |
| Cobalt | -- | yes | yes | yes | yes |
| Copper | -- | yes | yes | yes | -- |
| Cyanide | -- | -- | -- | -- | -- |
| Iron | -- | yes | no | yes | no |
| Lead | -- | yes | yes | -- | -- |
| Magnesium | -- | yes | yes | yes | no |
| Manganese | -- | yes* | yes* | yes* | no* |
| Mercury | -- | yes | -- | -- | -- |
| Nickel | -- | yes | yes | -- | -- |
| Potassium | -- | yes | no | yes | yes |
| Selenium | -- | -- | -- | -- | -- |
| Silver | -- | -- | -- | -- | -- |
| Sodium | -- | yes | -- | yes | yes |
| Thallium | -- | -- | --* | -- | -- |
| Vanadium | -- | yes | no* | yes | -- |
| Zinc | -- | yes | yes | -- | -- |

NOTES:

TLF - Tile Leach Field

"*" indicates that the maximum concentration of the chemical exceeded the RBC/WQC screening value.

"--" indicates that statistical comparisons were not conducted because analytic data did not meet the criteria for inclusion in the statistical evaluation. Refer to Appendix RI-J for criteria for inclusion, flow charts for the statistical evaluation, and the background comparison tables.

RBC - Risk Based Concentration. U.S. EPA Region III RBC Table, April 13, 2000.

WQC - Aquatic Water Quality Criteria. April 1999.

Only chemicals designated as "no*" or "--*" were carried through the risk assessment.

20-May-02

TABLE 6-3
CHEMICALS OF POTENTIAL CONCERN
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | CAS Number | Surface Soil | Subsurface Soil | Sediment | Ground Water | Surface Water |
|----------------------------|------------|-----------------|--------------------|----------|-----------------|------------------|
| 1,4-DIOXANE | 123-91-1 | | | | X | |
| ALUMINUM | 7429-90-5 | X | | | | |
| AMMONIA | 7664-41-7 | | | | X | |
| ANTIMONY | 7440-36-0 | | | X | | |
| ARSENIC | 7440-38-2 | | | X | X | |
| BENZO(A)ANTHRACENE | 56-55-3 | | | X | | |
| BENZO(A)PYRENE | 50-32-8 | | | X | | |
| BENZO(B)FLUORANTHENE | 205-99-2 | | | X | | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 117-81-7 | | | | | X |
| DIBENZ(A,H)ANTHRACENE | 53-70-3 | | | X | | |
| MANGANESE | 7439-96-5 | | | | | X |
| THALLIUM | 7440-28-0 | | | X | | |
| TOTAL PCBs | NA | | | X | | |
| VANADIUM | 7440-62-2 | | | X | | |

NOTES:

TLF - Tile Leach Field

CAS - Chemical Abstracts Service

COPC - chemical of potential concern

NA - not available

PCBs - polychlorinated biphenyls

X - constituent is a COPC in that medium

20-May-02

TABLE 6-11
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
CURRENT SCENARIO - RME EVALUATION

TLF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH, MA

| Parameter | On-Site Worker | | Trespassing Child (6<16) | | Construction Worker | |
|---|-------------------|------------|-----------------------------|------------|------------------------|------------|
| | Value | References | Value | References | Value | References |
| Parameters Used in the On-Site Surface Soil Pathway | | | | | | |
| Exposure Frequency (days/365 days) | 78 | (a) | 39 | (a) | 130 | (a) |
| Exposure Duration (yr) | 25 | (b) | 10 | (a) | 1 | (a) |
| Soil Ingestion Rate (mg/day) | 100 | (b) | 100 | (b) | 100 | (i) |
| Skin Contacting Medium (cm ²) | 2300 | (c,g) | 4780 | (c,g) | 2300 | (c,g) |
| Soil on Skin (mg/cm ²) | 0.5 | (f) | 0.5 | (f) | 0.5 | (f) |
| Body Weight (kg) | 70 | (e) | 36 | (c) | 70 | (e) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- | 20 | (e) |
| Parameters Used in the On-Site Subsurface Soil Pathway | | | | | | |
| Exposure Frequency (days/365 days) | NA | -- | NA | -- | 130 | (a) |
| Exposure Duration (yr) | NA | -- | NA | -- | 1 | (a) |
| Soil Ingestion Rate (mg/day) | NA | -- | NA | -- | 100 | (i) |
| Skin Contacting Medium (cm ²) | NA | -- | NA | -- | 2300 | (c,g) |
| Soil on Skin (mg/cm ²) | NA | -- | NA | -- | 0.5 | (f) |
| Body Weight (kg) | NA | -- | NA | -- | 70 | (e) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- | 20 | (e) |
| Parameters Used in the Surface Water Pathway | | | | | | |
| Exposure Time (hr/event) | 2 | (a) | 2 | (b) | NA | -- |
| Exposure Frequency (days/365 days) | 6 | (a) | 39 | (a) | NA | -- |
| Exposure Duration (yr) | 25 | (b) | 10 | (a) | NA | -- |
| Water Ingestion Rate (l/event) | 0.01 | (a,h) | 0.01 | (a,h) | NA | -- |
| Skin Contacting Medium (cm ²) | 2300 | (c,g) | 4780 | (c,g) | NA | -- |
| Body Weight (kg) | 70 | (e) | 36 | (c) | NA | -- |
| Parameters Used in the Sediment Pathway | | | | | | |
| Exposure Frequency (days/365 days) | 6 | (a) | 39 | (a) | NA | -- |
| Exposure Duration (yr) | 25 | (a) | 10 | (a) | NA | -- |
| Sediment Ingestion Rate (mg/day) | 50 | (j) | 50 | (j) | NA | -- |
| Skin Contacting Medium (cm ²) | 2300 | (c,g) | 4780 | (c,g) | NA | -- |
| Sediment on Skin (mg/cm ²) | 0.5 | (f) | 0.5 | (f) | NA | -- |
| Body Weight (kg) | 70 | (e) | 36 | (c) | NA | -- |
| Parameters Used in the Drinking Water Pathway | | | | | | |
| Exposure Frequency (days/365 days) | NA | -- | NA | -- | NA | -- |
| Exposure Duration (yr) | NA | -- | NA | -- | NA | -- |
| Water Ingestion Rate (l/event) | NA | -- | NA | -- | NA | -- |
| Body Weight (kg) | NA | -- | NA | -- | NA | -- |

NOTES:

TLF - Tile Leach Field

EPA - Environmental Protection Agency

cm² - square centimeter

hr - hour

kg - kilogram

l/event - liter per event

m³/day - cubic meters per day

mg/cm² - milligrams per square centimeter

mg/day - milligrams per day

NA - Not applicable; this receptor is not assumed to be exposed via this pathway or in this area

RME - reasonable maximum exposure

yr - year

(a) Best professional judgement.

(b) EPA, 1994. U.S. EPA Region I Risk Update. August 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043.

(d) EPA 1989. Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, DC. EPA 540/1-89/002.

(f) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

(g) Assumed exposure to hands, forearms, lower legs, and feet.

(h) Assumed exposure to 1/5 the amount assumed for swimming in (a).

(i) Modification of Hawley equation (U.S. EPA, 1982). Assumes equal ingestion of surface and subsurface soil, resulting in a total of 200 mg/day for combined exposure to surface and subsurface soil.

(j) Sediment ingestion assumed to be half of soil ingestion rates.

Source: ENSR 1996

TABLE 6-12
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
CURRENT SCENARIO - CTC EVALUATION

TLF
REMEDIAL INVESTIGATION
MAS SOUTH WEYMOUTH, MA

| Parameter | On-Site Worker | | Trespassing Child (6<15) | | Construction Worker | |
|---|----------------|-----------|--------------------------|-----------|---------------------|-----------|
| | Value | Reference | Value | Reference | Value | Reference |
| Parameters Used in the On-Site Surface Soil Pathway | | | | | | |
| Exposure Frequency (days/365 days) | 35 | (a) | 8 | (a) | 10 | (a) |
| Exposure Duration (yr) | 8 | (d) | 10 | (a) | 1 | (a) |
| Soil Ingestion Rate (mg/day) | 50 | (b) | 50 | (b) | 50 | (i) |
| Skin Contacting Medium (cm ²) | 2300 | (c,g) | 4780 | (c,g) | 2300 | (c,g) |
| Soil on Skin (mg/cm ²) | 0.5 | (f) | 0.5 | (f) | 0.5 | (f) |
| Body Weight (kg) | 70 | (e) | 36 | (c) | 70 | (e) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- | 20 | (e) |
| Parameters Used in the On-Site Subsurface Soil Pathway | | | | | | |
| Exposure Frequency (days/365 days) | NA | -- | NA | -- | 10 | (a) |
| Exposure Duration (yr) | NA | -- | NA | -- | 1 | (a) |
| Soil Ingestion Rate (mg/day) | NA | -- | NA | -- | 50 | (i) |
| Skin Contacting Medium (cm ²) | NA | -- | NA | -- | 2300 | (c,g) |
| Soil on Skin (mg/cm ²) | NA | -- | NA | -- | 0.5 | (f) |
| Body Weight (kg) | NA | -- | NA | -- | 70 | (e) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- | 20 | (e) |
| Parameters Used in the Surface Water Pathway | | | | | | |
| Exposure Time (hr/event) | NA | | 1 | (a) | NA | |
| Exposure Frequency (days/365 days) | NA | | 8 | (a) | NA | |
| Exposure Duration (yr) | NA | | 10 | (a) | NA | |
| Water Ingestion Rate (l/event) | NA | | 0.01 | (a,h) | NA | |
| Skin Contacting Medium (cm ²) | NA | | 4780 | (c,g) | NA | |
| Body Weight (kg) | NA | | 36 | (c) | NA | |
| Parameters Used in the Sediment Pathway | | | | | | |
| Exposure Frequency (days/365 days) | NA | | 8 | (a) | NA | |
| Exposure Duration (yr) | NA | | 10 | (a) | NA | |
| Sediment Ingestion Rate (mg/day) | NA | | 25 | (i) | NA | |
| Skin Contacting Medium (cm ²) | NA | | 4780 | (c,g) | NA | |
| Sediment on Skin (mg/cm ²) | NA | | 0.5 | (f) | NA | |
| Body Weight (kg) | NA | | 36 | (c) | NA | |
| Parameters Used in the Drinking Water Pathway | | | | | | |
| Exposure Frequency (days/365 days) | NA | | NA | | NA | |
| Exposure Duration (yr) | NA | | NA | | NA | |
| Water Ingestion Rate (l/event) | NA | | NA | | NA | |
| Body Weight (kg) | NA | | NA | | NA | |

NOTES:

TLF - Tile Leach Field

CTC - central tendency case

EPA - Environmental Protection Agency

cm² - square centimeter

kg - kilogram

l/event - liter per event

m³/day - cubic meters per day

mg/cm² - milligrams per square centimeter

mg/day - milligrams per day

NA - Not applicable; this receptor is not assumed to be exposed via this pathway or in this area

yr - year

(a) Best professional judgement.

(b) EPA, 1994. U.S. EPA Region I Risk Update. August 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/3-89-043.

(d) Bureau of Labor Statistics, 1991.

(e) EPA 1989. Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual (Part A). Office of Emergency and Remedial Response, Washington, DC. EPA 540/1-89/002.

(f) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

(g) Assumed exposure to hands, forearms, lower legs, and feet.

(h) Assumed 1/5 of the amount assumed for swimming in (e).

(i) Modification of Hawley equation (U.S. EPA 1992). Assumes equal ingestion of surface and subsurface soil, resulting in a total of 100 mg/day for combined exposure to surface and subsurface soil.

(j) Sediment ingestion assumed to be half of soil ingestion rates.

Source: ENSR 1998

TABLE G-13
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
FUTURE RESIDENTIAL SCENARIO - RME EVALUATION

TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Parameter | On-site Resident | | | |
|---|------------------|-----------|-------|-----------|
| | Child (1-6) | Reference | Adult | Reference |
| Parameters Used in the On-Site Surface Soil Pathway | | | | |
| Exposure Frequency (days/365 days) | 170 | (g) | 150 | (b) |
| Exposure Duration (yr) | 5 | (b) | 24 | (b) |
| Soil Ingestion Rate (mg/day) | 200 | (c) | 100 | (c) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Soil on Skin (mg/cm ²) | 0.5 | (a) | 0.5 | (a) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- |
| Parameters Used in the On-Site Subsurface Soil Pathway | | | | |
| Exposure Frequency (days/365 days) | NA | -- | NA | -- |
| Exposure Duration (yr) | NA | -- | NA | -- |
| Soil Ingestion Rate (mg/day) | NA | -- | NA | -- |
| Skin Contacting Medium (cm ²) | NA | -- | NA | -- |
| Soil on Skin (mg/cm ²) | NA | -- | NA | -- |
| Body Weight (kg) | NA | -- | NA | -- |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- |
| Parameters Used in the Surface Water Pathway | | | | |
| Exposure Time (hr/event) | 2 | (a) | 2 | (a) |
| Exposure Frequency (days/365 days) | 104 | (a) | 12 | (a) |
| Exposure Duration (yr) | 6 | (b) | 24 | (b) |
| Water Ingestion Rate (l/event) | 0.01 | (a,h) | 0.01 | (a,h) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Parameters Used in the Sediment Pathway | | | | |
| Exposure Frequency (days/365 days) | 104 | (a) | 12 | (a) |
| Exposure Duration (yr) | 6 | (b) | 24 | (b) |
| Sediment Ingestion Rate (mg/day) | 50 | (g) | 50 | (g) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Sediment on Skin (mg/cm ²) | 0.5 | (e) | 0.5 | (e) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Parameters Used in the Drinking Water Pathway | | | | |
| Exposure Frequency (days/365 days) | 350 | (b) | 350 | (b) |
| Exposure Duration (yr) | 6 | (b) | 24 | (b) |
| Water Ingestion Rate (l/event) | 1 | (i) | 2 | (b) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |

NOTES:

TLF - Tile Leach Field

EPA - Environmental Protection Agency

cm² - square centimeter

hr - hour

kg - kilogram

l/event - liter per event

m³/day - cubic meters per day

mg/cm² - milligrams per square centimeter

mg/day - milligrams per day

NA - not applicable; this receptor is not assumed to be exposed via this pathway or in this area

RME - reasonable maximum exposure

yr - year

(a) Best professional judgement.

(b) EPA, 1994. U.S. EPA Region I Risk Update. August 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043.

(d) EPA 1989. Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual (Part A).

Office of Emergency and Remedial Response, Washington, DC. EPA 540/1-89/002.

(e) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA/600/8-91/011B.

(f) Assumed exposure to hands, forearms, lower legs, and feet.

(g) Sediment ingestion rate assumed to be half of adult soil ingestion rate and quarter of child soil ingestion rate.

(h) Assumed exposure is 1/5 the amount of exposure from swimming.

(i) Roseberry and Burmaster, 1992.

Source: ENSR 1998

TABLE 6-14
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
FUTURE RESIDENTIAL SCENARIO - CTC EVALUATION
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Parameter | On-Site Resident | | | |
|---|------------------|------------|-------|------------|
| | Child (1x6) | References | Adult | References |
| Parameters Used in the On-Site Surface Soil Pathway | | | | |
| Exposure Frequency (days/365 days) | 150 | (b) | 150 | (b) |
| Exposure Duration (yr) | 2 | (b) | 7 | (b) |
| Soil Ingestion Rate (mg/day) | 100 | (c) | 50 | (c) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Soil on Skin (mg/cm ²) | 0.5 | (e) | 0.5 | (e) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- |
| Parameters Used in the On-Site Subsurface Soil Pathway | | | | |
| Exposure Frequency (days/365 days) | NA | -- | NA | -- |
| Exposure Duration (yr) | NA | -- | NA | -- |
| Soil Ingestion Rate (mg/day) | NA | -- | NA | -- |
| Skin Contacting Medium (cm ²) | NA | -- | NA | -- |
| Soil on Skin (mg/cm ²) | NA | -- | NA | -- |
| Body Weight (kg) | NA | -- | NA | -- |
| Inhalation Rate for Dust and Volatiles (m ³ /day) | NA | -- | NA | -- |
| Parameters Used in the Surface Water Pathway | | | | |
| Exposure Time (hr/event) | 1 | (a) | 1 | (a) |
| Exposure Frequency (days/365 days) | 52 | (a) | 6 | (a) |
| Exposure Duration (yr) | 2 | (b) | 7 | (b) |
| Water Ingestion Rate (l/event) | 0.01 | (a,h) | 0.01 | (a,h) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Parameters Used in the Sediment Pathway | | | | |
| Exposure Frequency (days/365 days) | 52 | (a) | 6 | (a) |
| Exposure Duration (yr) | 2 | (a) | 7 | (a) |
| Sediment Ingestion Rate (mg/day) | 25 | (g) | 25 | (g) |
| Skin Contacting Medium (cm ²) | 2085 | (c,f) | 2300 | (c,f) |
| Sediment on Skin (mg/cm ²) | 0.5 | (e) | 0.5 | (e) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |
| Parameters Used in the Drinking Water Pathway | | | | |
| Exposure Frequency (days/365 days) | 350 | (b) | 350 | (b) |
| Exposure Duration (yr) | 2 | (b) | 7 | (b) |
| Water Ingestion Rate (l/event) | 0.6 | (i) | 1.4 | (b) |
| Body Weight (kg) | 15 | (b) | 70 | (d) |

NOTES:

TLF - Tile Leach Field

CTC - central tendency case

EPA - Environmental Protection Agency

cm² - square centimeter

hr - hour

kg - kilogram

l/event - liter per event

m³/day - cubic meters per day

mg/cm² - milligrams per square centimeter

NA - not applicable; this receptor is not assumed to be exposed via this pathway or in this area

yr - year

(a) Best professional judgement.

(b) EPA, 1994. U.S. EPA Region I Risk Update. August 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043.

(d) EPA 1989. Risk Assessment Guidance for Superfund, Volume 1. Human Health Evaluation Manual (Part A).

Office of Emergency and Remedial Response, Washington, DC. EPA 540/1-89/002.

(e) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. Interim Report. EPA 600/8-91/011B.

(f) Assumed exposure to hands, forearms, lower legs, and feet.

(g) Sediment ingestion rate assumed to be half of adult soil ingestion rate and quarter of child soil ingestion rate.

(h) Assumed exposure is 1/5 the amount of exposure from swimming.

(i) Roseberry and Burmaster, 1992.

Source: ENSR 1998

TABLE 6-15
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
FUTURE RECREATIONAL SCENARIO - RME EVALUATION
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Parameter | Recreational Child (1<6) | |
|--|-----------------------------|------------|
| | Value | References |
| Parameters Used in the Surface Soil Pathway | | |
| Exposure Frequency (days/365 days) | 141 | (a) |
| Exposure Duration (yr) | 6 | (b) |
| Soil Ingestion Rate (mg/day) | 200 | (b) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Soil on Skin (mg/cm ²) | 0.50 | (d) |
| Body Weight (kg) | 15 | (e) |
| Parameters Used in the Sediment Pathway | | |
| Exposure Frequency (days/365 days) | 104 | (f) |
| Exposure Duration (yr) | 6 | (b) |
| Sediment Ingestion Rate (mg/day) | 50 | (b,g) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Soil on Skin (mg/cm ²) | 0.5 | (d) |
| Body Weight (kg) | 15 | (e) |
| Parameters Used in the Surface Water Pathway | | |
| Exposure Time (hr/event) | 2 | (f) |
| Exposure Frequency (days/365 days) | 104 | (f) |
| Exposure Duration (yr) | 6 | (b) |
| Water Ingestion Rate (l/event) | 0.01 | (e,h) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Body Weight (kg) | 15 | (e) |

NOTES:

TLF - Tile Leach Field

EPA - Environmental Protection Agency

cm² - square centimeter

hr - hour

kg - kilogram

l/event - liter per event

m³/day - cubic meters per day

mg/cm² - milligrams per square centimeter

mg/day - milligrams per day

RME - reasonable maximum exposure

yr - year

(a) EPA, 1997. Exposure Factors Handbook, Vol. I. Office of Research and Development, Washington, DC.

EPA 600/P-95/002Fa. Assumed average of days of outdoor activity for a young child (130 days/year) and older child (152 days/year).

(b) Professional judgement. Assumed to be similar to residential exposure. U.S. EPA, 1994a. U.S. EPA Region I Risk Update. August, 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043. Assumed exposure to hands, forearms, lower legs and feet.

(d) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

(e) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043.

(f) Best professional judgement. Assumed sediment and surface water exposure for 4 days/week, 6 months/year.

(g) Best professional judgement. Assumed one-quarter of soil ingestion rate.

(h) Best professional judgement. Assumed one-fifth of water ingested during swimming.

Source: ENSR 1996

TABLE 6-16
SUMMARY OF POTENTIAL EXPOSURE ASSUMPTIONS
FUTURE RECREATIONAL SCENARIO - CTC EVALUATION
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Parameter | Recreational Child (1<6) | |
|--|-----------------------------|------------|
| | Value | References |
| Parameters Used in the Surface Soil Pathway | | |
| Exposure Frequency (days/365 days) | 141 | (a) |
| Exposure Duration (yr) | 2 | (b) |
| Soil Ingestion Rate (mg/day) | 100 | (b) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Soil on Skin (mg/cm ²) | 0.50 | (d) |
| Body Weight (kg) | 15 | (e) |
| Parameters Used in the Sediment Pathway | | |
| Exposure Frequency (days/365 days) | 52 | (f) |
| Exposure Duration (yr) | 2 | (b) |
| Sediment Ingestion Rate (mg/day) | 25 | (b,g) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Soil on Skin (mg/cm ²) | 0.5 | (d) |
| Body Weight (kg) | 15 | (e) |
| Parameters Used in the Surface Water Pathway | | |
| Exposure Time (hr/event) | 1 | (f) |
| Exposure Frequency (days/365 days) | 52 | (f) |
| Exposure Duration (yr) | 2 | (b) |
| Water Ingestion Rate (l/event) | 0.01 | (e,h) |
| Skin Contacting Medium (cm ²) | 2085 | (c) |
| Body Weight (kg) | 15 | (e) |

NOTES:

TLF - Tile Leach Field

CTC - central tendency case

EPA - Environmental Protection Agency

cm² - square centimeters

hr - hour

kg - kilogram

l/event - liter per event

mg/cm² - milligrams per square centimeter

yr - year

(a) EPA, 1997. Exposure Factors Handbook, Vol. I. Office of Research and Development, Washington, DC EPA 600/P-95/002Fa. Assumed average of days of outdoor activity for a young child (130 days/year) and older child (152 days/year).

(b) Professional judgement. Assumed to be similar to residential exposure. U.S. EPA, 1994a. U.S. EPA Region I Risk Update. August, 1994.

(c) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043. Assumed exposure to hands, forearms, lower legs and feet.

(d) EPA, 1992. Dermal Exposure Assessment: Principles and Applications. EPA/600/8-91/011B.

(e) EPA, 1989. Exposure Factors Handbook. Office of Health and Environmental Assessment, Washington, DC. EPA 600/8-89/043.

(f) Best professional judgement. Assumed sediment and surface water exposure for 2 days/week, 6 months/year.

(g) Best professional judgement. Assumed one-quarter of soil ingestion rate.

(h) Best professional judgement. Assumed one-fifth of water ingested during swimming.

Source: ENSR 1998

TABLE 6-17
COPC EPCs BY MEDIUM
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | CAS NO | EPC By Medium | | | | | |
|----------------------------|-----------|-------------------------|----------------------------|---------------------|------------------------------------|----------------------------|------------------------------------|
| | | Surface Soil (mg/kg) | Subsurface Soil (mg/kg) | Sediment (mg/kg) | Ground Water (CTC) (mg/L) | Surface Water (mg/L) | Ground Water (RME) (mg/L) |
| 1,4-DIOXANE | 123-91-1 | NCOPC | NCOPC | NCOPC | 1.3E-02 | NCOPC | 1.3E-02 |
| ALUMINUM | 7429-90-5 | 2.0E+04 | NCOPC | NCOPC | NCOPC | NCOPC | NCOPC |
| AMMONIA | 7664-41-7 | NCOPC | NCOPC | NCOPC | 1.9E-01 | NCOPC | 2.3E-01 |
| ANTIMONY | 7440-36-0 | NCOPC | NCOPC | 8.1E+00 | NCOPC | NCOPC | NCOPC |
| ARSENIC | 7440-38-2 | NCOPC | NCOPC | 5.9E+00 | 2.0E-03 | NCOPC | 2.8E-03 |
| BENZO(A)ANTHRACENE | 56-55-3 | NCOPC | NCOPC | 9.4E-01 | NCOPC | NCOPC | NCOPC |
| BENZO(A)PYRENE | 50-32-8 | NCOPC | NCOPC | 7.2E-01 | NCOPC | NCOPC | NCOPC |
| BENZO(B)FLUORANTHENE | 205-99-2 | NCOPC | NCOPC | 9.5E-01 | NCOPC | NCOPC | NCOPC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 117-81-7 | NCOPC | NCOPC | NCOPC | NCOPC | 1.3E-02 | NCOPC |
| DIBENZ(A,H)ANTHRACENE | 53-70-3 | NCOPC | NCOPC | 2.8E-01 | NCOPC | NCOPC | NCOPC |
| MANGANESE | 7439-96-5 | NCOPC | NCOPC | NCOPC | NCOPC | 5.9E-01 | NCOPC |
| THALLIUM | 7440-28-0 | NCOPC | NCOPC | 3.6E+00 | NCOPC | NCOPC | NCOPC |
| TOTAL PCBs | NA | NCOPC | NCOPC | 6.4E-01 | NCOPC | NCOPC | NCOPC |
| VANADIUM | 7440-62-2 | NCOPC | NCOPC | 8.6E+01 | NCOPC | NCOPC | NCOPC |

NOTES:

TLF - Tile Leach Field

CAS NO - Chemical Abstracts Service

COPC - chemical of potential concern

CTC - central tendency case

EPC - exposure point concentration

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

NA - not available

NCOPC - not a chemical of potential concern

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

20-May-02

TABLE 6-18
SELECTION OF EXPOSURE POINT CONCENTRATIONS FOR GROUNDWATER
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Frequency of Detection | CTC (a) (mg/L) | RME (b) (mg/L) |
|----------------------------|------------------------------|-------------------|-------------------|
| Groundwater (mg/L) | | | |
| 1,4-DIOXANE | 1 : 1 | 1.3E-02 | 1.3E-02 |
| ALUMINUM | 2 : 6 | NCOPC | NCOPC |
| AMMONIA | 4 : 4 | 1.9E-01 | 2.3E-01 |
| ANTIMONY | ND : ND | NCOPC | NCOPC |
| ARSENIC | 1 : 6 | 2.0E-03 | 2.8E-03 |
| BENZO(A)ANTHRACENE | ND : ND | NCOPC | NCOPC |
| BENZO(A)PYRENE | ND : ND | NCOPC | NCOPC |
| BENZO(B)FLUORANTHENE | ND : ND | NCOPC | NCOPC |
| BIS(2-ETHYLHEXYL)PHTHALATE | ND : ND | NCOPC | NCOPC |
| DIBENZ(A,H)ANTHRACENE | ND : ND | NCOPC | NCOPC |
| MANGANESE | 5 : 6 | NCOPC | NCOPC |
| THALLIUM | ND : ND | NCOPC | NCOPC |
| TOTAL PCB | ND : ND | NCOPC | NCOPC |
| VANADIUM | 1 : 5 | NCOPC | NCOPC |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

CTC - central tendency case

mg/L - milligrams per liter

NCOPC - not a chemical of potential concern

ND - chemical not detected in this medium

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

(a) Used the arithmetic mean concentration of all wells at the TLF.

(b) Used the maximum concentration of all wells at the TLF.

20-May-02

TABLE 6-19
SELECTION OF EXPOSURE POINT CONCENTRATIONS FOR SOIL,
SEDIMENT, AND SURFACE WATER
TLF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH, MA

| Chemical | Frequency of Detection | Shapiro-Wilks Test For Normality (a) | | | 95% Upper Confidence Limit | | UCL (b) | Maximum Detect | EPC (c) |
|----------------------------|------------------------------|---|-----------|-------------------------|-------------------------------|-----------|---------|-------------------|---------|
| | | Normal | Lognormal | Dataset Distribution | t-Test | | | | |
| | | | | | (Norm) | (Lognorm) | | | |
| Surface Soil (mg/kg) | | | | | | | | | |
| 1,4-DIOXANE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ALUMINUM | 3 : 3 | 0.8819 | 0.9741 | LOGNORM | 2.5E+04 | 1.8E+07 | 1.8E+07 | 2.0E+04 | 2.0E+04 |
| AMMONIA | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ANTIMONY | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ARSENIC | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)PYRENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(B)FLUORANTHENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 2 : 3 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| DIBENZ(A,H)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| MANGANESE | 3 : 3 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| THALLIUM | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| TOTAL PCBs | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| VANADIUM | 3 : 3 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| Subsurface Soil (mg/kg) | | | | | | | | | |
| 1,4-DIOXANE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ALUMINUM | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| AMMONIA | 2 : 2 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ANTIMONY | 4 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ARSENIC | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)PYRENE | 1 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(B)FLUORANTHENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 3 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| DIBENZ(A,H)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| MANGANESE | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| THALLIUM | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| TOTAL PCBs | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| VANADIUM | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| Sediment (mg/kg) | | | | | | | | | |
| 1,4-DIOXANE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ALUMINUM | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| AMMONIA | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ANTIMONY | 2 : 3 | 0.8952 | 0.9994 | LOGNORM | 1.0E+01 | 3.3E+09 | 3.3E+09 | 8.1E+00 | 8.1E+00 |
| ARSENIC | 5 : 5 | 0.9913 | 0.9578 | NORM | 5.9E+00 | 1.5E+01 | 5.9E+00 | 6.8E+00 | 5.9E+00 |
| BENZO(A)ANTHRACENE | 3 : 5 | 0.6297 | 0.7066 | LOGNORM | 6.7E-01 | 1.3E+00 | 1.3E+00 | 9.4E-01 | 9.4E-01 |
| BENZO(A)PYRENE | 2 : 5 | 0.8160 | 0.8986 | LOGNORM | 5.6E-01 | 9.0E-01 | 9.0E-01 | 7.2E-01 | 7.2E-01 |
| BENZO(B)FLUORANTHENE | 3 : 5 | 0.7379 | 0.9022 | LOGNORM | 7.1E-01 | 1.4E+00 | 1.4E+00 | 9.5E-01 | 9.5E-01 |
| BIS(2-ETHYLHEXYL)PHTHALATE | 4 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| DIBENZ(A,H)ANTHRACENE | 1 : 5 | 0.8276 | 0.5299 | LOGNORM | 2.9E-01 | 3.3E-01 | 3.3E-01 | 2.8E-01 | 2.8E-01 |
| MANGANESE | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| THALLIUM | 3 : 5 | 0.5119 | 0.7102 | LOGNORM | 2.5E+00 | 7.8E+00 | 7.8E+00 | 3.6E+00 | 3.6E+00 |
| TOTAL PCBs | 1 : 6 | 0.5175 | 0.6397 | LOGNORM | 3.3E-01 | 3.9E+00 | 3.9E+00 | 6.4E-01 | 6.4E-01 |
| VANADIUM | 5 : 5 | 0.8763 | 0.9745 | LOGNORM | 6.6E+01 | 3.0E+02 | 3.0E+02 | 8.6E+01 | 8.6E+01 |
| Surfacewater (mg/L) | | | | | | | | | |
| 1,4-DIOXANE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ALUMINUM | 5 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| AMMONIA | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ANTIMONY | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| ARSENIC | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(A)PYRENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| BENZO(B)FLUORANTHENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |

TABLE 6-19
SELECTION OF EXPOSURE POINT CONCENTRATIONS FOR SOIL,
SEDIMENT, AND SURFACE WATER
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Frequency of Detection | Shapiro-Wilks Test For Normality (a) | | | 95% Upper Confidence Limit | | UCL (b) | Maximum Detect | EPC (c) |
|----------------------------|------------------------------|---|-----------|-------------------------|-------------------------------|---------------------|---------|-------------------|---------|
| | | Normal | Lognormal | Dataset Distribution | t-Test (Norm) | H-Test (Lognorm) | | | |
| BIS(2-ETHYLHEXYL)PHTHALATE | 1 : 3 | 0.7500 | 0.7499 | NORM | 1.5E-02 | 1.4E-01 | 1.5E-02 | 1.3E-02 | 1.3E-02 |
| DIBENZ(A,H)ANTHRACENE | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| MANGANESE | 5 : 5 | 0.9359 | 0.9117 | NORM | 5.9E-01 | 6.3E-01 | 5.9E-01 | 6.1E-01 | 5.9E-01 |
| THALLIUM | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| TOTAL PCBs | ND : ND | NC | NC | NC | NC | NC | NC | NC | NCOPC |
| VANADIUM | 3 : 5 | NC | NC | NC | NC | NC | NC | NC | NCOPC |

NOTES:

TLF - Tile Leach Field

mg/kg - milligrams per kilogram

mg/L - milligrams per liter

NC - not calculated; not a COPC in this medium

NC_S - not calculated; sample size not sufficient for statistics

ND - chemical not detected in this medium

NCOPC - not a chemical of potential concern

UCL - upper confidence limit

EPC - exposure point concentration

- (a) - The results of the Shapiro-Wilks test for normality indicates whether the data set is more likely to be normally distributed or lognormally distributed. The data set is considered to be normally distributed if the test result is higher in the column labeled "NORMAL". The data set is considered to be lognormally distributed if the test result is higher in the column labeled "LOGNORMAL".
- (b) - 95% UCL is selected based on whether the data set is normally or lognormally distributed. The UCL based on the t-statistic is chosen for a normal distribution, and the UCL based on the H-statistic is chosen if the data are lognormally distributed.
- (c) - EPC is the lower of the selected 95% UCL and the Maximum Detected Concentration.

PCBs - polychlorinated biphenyls

LOGNORM - lognormal

NORM - normal

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TABLE 6-20
COPC EPCs FOR DUST FROM SURFACE AND SUBSURFACE SOIL
TLF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH, MA

| Chemical | CAS NO | EPC By Medium (mg/m ³) (a) | |
|----------------------------|-----------|--|-----------------|
| | | Surface Soil | Subsurface Soil |
| 1,4-DIOXANE | 123-91-1 | NCOPC | NCOPC |
| ALUMINUM | 7429-90-5 | 1.2E-03 | NCOPC |
| AMMONIA | 7664-41-7 | NCOPC | NCOPC |
| ANTIMONY | 7440-36-0 | NCOPC | NCOPC |
| ARSENIC | 7440-38-2 | NCOPC | NCOPC |
| BENZO(A)ANTHRACENE | 56-55-3 | NCOPC | NCOPC |
| BENZO(A)PYRENE | 50-32-8 | NCOPC | NCOPC |
| BENZO(B)FLUORANTHENE | 205-99-2 | NCOPC | NCOPC |
| BIS(2-ETHYLHEXYL)PHTHALATE | 117-81-7 | NCOPC | NCOPC |
| DIBENZ(A,H)ANTHRACENE | 53-70-3 | NCOPC | NCOPC |
| MANGANESE | 7439-96-5 | NCOPC | NCOPC |
| THALLIUM | 7440-28-0 | NCOPC | NCOPC |
| TOTAL PCBs | NA | NCOPC | NCOPC |
| VANADIUM | 7440-62-2 | NCOPC | NCOPC |

NOTES:

TLF - Tile Leach Field

CAS NO - Chemical Abstracts Service

COPC - chemical of potential concern

EPC - exposure point concentration

mg/kg - milligrams per kilogram

mg/m³ - milligrams per cubic meter

NA - not available

NCOPC - not a chemical of potential concern

PCBs - polychlorinated biphenyls

(a) Chemical concentration in air (mg/m³) = soil concentration (mg/kg) *
respirable particles in air (mg/m³) * unit correction factor (1 kg/10⁶ mg).

The concentration of respirable particles in air was assumed to be

0.06 mg/m³ and is based on the MADEP PM-10 value (MADEP, 1995).

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TABLE 6-23
CARCINOGENIC ASSESSMENT ON-SITE WORKER
RME - TOTAL
TLF
REMEDIAL INVESTIGATION
HAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|-----------------|----------|------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | NC | NC | NC | NC |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC |
| ARSENIC | NC | 3.7E-08 | NC | 3.7E-08 |
| BENZO(A)ANTHRACENE | NC | 2.2E-09 | NC | 2.2E-09 |
| BENZO(A)PYRENE | NC | 1.7E-08 | NC | 1.7E-08 |
| BENZO(B)FLUORANTHENE | NC | 2.2E-09 | NC | 2.2E-09 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 2.4E-09 | 2.4E-09 |
| DIBENZ(A,H)ANTHRACENE | NC | 6.4E-09 | NC | 6.4E-09 |
| MANGANESE | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC |
| TOTAL PCBs | NC | 9.4E-09 | NC | 9.4E-09 |
| VANADIUM | NC | NC | NC | NC |
| TOTAL | NC | 7.3E-08 | 2.4E-09 | 7.6E-08 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - not calculated; not a COPC in this medium, not classified as a class A, B, or C carcinogen,
or no dose-response value available

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-24
 NONCARCINOGENIC ASSESSMENT - ON-SITE WORKER
 RME - TOTAL
 TLF
 REMEDIAL INVESTIGATION
 NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|--------------|----------|---------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | 6.4E-03 | NC | NC | 6.4E-03 |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | 2.8E-04 | NC | 2.8E-04 |
| ARSENIC | NC | 2.3E-04 | NC | 2.3E-04 |
| BENZO(A)ANTHRACENE | NC | 9.5E-07 | NC | 9.5E-07 |
| BENZO(A)PYRENE | NC | 7.3E-07 | NC | 7.3E-07 |
| BENZO(B)FLUORANTHENE | NC | 9.6E-07 | NC | 9.6E-07 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 2.4E-05 | 2.4E-05 |
| DIBENZ(A,H)ANTHRACENE | NC | 2.8E-07 | NC | 2.8E-07 |
| MANGANESE | NC | NC | 2.3E-04 | 2.3E-04 |
| THALLIUM | NC | 5.4E-04 | NC | 5.4E-04 |
| TOTAL PCBs | NC | 6.6E-04 | NC | 6.6E-04 |
| VANADIUM | NC | 1.8E-04 | NC | 1.8E-04 |
| TOTAL | 0.0064 | 0.0019 | 0.00025 | 0.0085 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - Not calculated; not a COPC in this medium or no dose-response value available.

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-27
CARCINOGENIC ASSESSMENT - TRESPASSING CHILD
RME - TOTAL
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|-----------------|----------|------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | NC | NC | NC | NC |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC |
| ARSENIC | NC | 2.0E-07 | NC | 2.0E-07 |
| BENZO(A)ANTHRACENE | NC | 1.8E-08 | NC | 1.8E-08 |
| BENZO(A)PYRENE | NC | 1.4E-07 | NC | 1.4E-07 |
| BENZO(B)FLUORANTHENE | NC | 1.8E-08 | NC | 1.8E-08 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 2.4E-08 | 2.4E-08 |
| DIBENZ(A,H)ANTHRACENE | NC | 5.4E-08 | NC | 5.4E-08 |
| MANGANESE | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC |
| TOTAL PCBs | NC | 7.4E-08 | NC | 7.4E-08 |
| VANADIUM | NC | NC | NC | NC |
| TOTAL | NC | 5.0E-07 | 2.4E-08 | 5.3E-07 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - not calculated; not a COPC in this medium, not classified as a class A, B, or C carcinogen,
or no dose-response value available

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-28
NONCARCINOGENIC ASSESSMENT - TRESPASSING CHILD
RME - TOTAL
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|-----------------|----------|------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | 6.6E-03 | NC | NC | 6.6E-03 |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | 4.0E-03 | NC | 4.0E-03 |
| ARSENIC | NC | 3.1E-03 | NC | 3.1E-03 |
| BENZO(A)ANTHRACENE | NC | 2.4E-05 | NC | 2.4E-05 |
| BENZO(A)PYRENE | NC | 1.8E-05 | NC | 1.8E-05 |
| BENZO(B)FLUORANTHENE | NC | 2.4E-05 | NC | 2.4E-05 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 6.0E-04 | 6.0E-04 |
| DIBENZ(A,H)ANTHRACENE | NC | 7.0E-06 | NC | 7.0E-06 |
| MANGANESE | NC | NC | 5.1E-03 | 5.1E-03 |
| THALLIUM | NC | 7.0E-03 | NC | 7.0E-03 |
| TOTAL PCBs | NC | 1.3E-02 | NC | 1.3E-02 |
| VANADIUM | NC | 2.7E-03 | NC | 2.7E-03 |
| TOTAL | 0.0066 | 0.030 | 0.0057 | 0.042 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - Not calculated; not a COPC in this medium or no dose-response value available.

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-31
 CARCINOGENIC ASSESSMENT - CONSTRUCTION WORKER
 RME - TOTAL
 TLF
 REMEDIAL INVESTIGATION
 NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil Inhalation | Subsurface Soil Inhalation | Surface Soil | Subsurface Soil | Total |
|----------------------------|----------------------------|-------------------------------|-----------------|--------------------|-------|
| 1,4-DIOXANE | NC | NC | NC | NC | NC |
| ALUMINUM | NC | NC | NC | NC | NC |
| AMMONIA | NC | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC | NC |
| ARSENIC | NC | NC | NC | NC | NC |
| BENZO(A)ANTHRACENE | NC | NC | NC | NC | NC |
| BENZO(A)PYRENE | NC | NC | NC | NC | NC |
| BENZO(B)FLUORANTHENE | NC | NC | NC | NC | NC |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | NC | NC | NC |
| DIBENZ(A,H)ANTHRACENE | NC | NC | NC | NC | NC |
| MANGANESE | NC | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC | NC |
| TOTAL PCBs | NC | NC | NC | NC | NC |
| VANADIUM | NC | NC | NC | NC | NC |
| TOTAL | NC | NC | NC | NC | NC |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - not calculated; not a COPC in this medium, not classified as a class A, B, or C carcinogen,
 or no dose-response value available

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-32
 NONCARCINOGENIC ASSESSMENT - CONSTRUCTION WORKER
 RME - TOTAL
 TLF
 REMEDIAL INVESTIGATION
 NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil Inhalation | Subsurface Soil Inhalation | Surface Soil | Subsurface Soil | Total |
|----------------------------|----------------------------|-------------------------------|-----------------|--------------------|----------|
| 1,4-DIOXANE | NC | NC | NC | NC | NC |
| ALUMINUM | 1.21E-01 | NC | 1.07E-02 | NC | 1.32E-01 |
| AMMONIA | NC | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC | NC |
| ARSENIC | NC | NC | NC | NC | NC |
| BENZO(A)ANTHRACENE | NC | NC | NC | NC | NC |
| BENZO(A)PYRENE | NC | NC | NC | NC | NC |
| BENZO(B)FLUORANTHENE | NC | NC | NC | NC | NC |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | NC | NC | NC |
| DIBENZ(A,H)ANTHRACENE | NC | NC | NC | NC | NC |
| MANGANESE | NC | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC | NC |
| TOTAL PCBs | NC | NC | NC | NC | NC |
| VANADIUM | NC | NC | NC | NC | NC |
| TOTAL | 0.12 | NC | 0.011 | NC | 0.13 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - Not calculated; not a COPC in this medium or no dose-response value available.

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-35
CARCINOGENIC ASSESSMENT - FUTURE RESIDENT
RME - TOTAL
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Drinking Water | Total |
|----------------------------|-----------------|----------|------------------|-------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | 2.1E-06 | 2.1E-06 |
| ALUMINUM | NC | NC | NC | NC | NC |
| AMMONIA | NC | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC | NC |
| ARSENIC | NC | 7.8E-07 | NC | 6.2E-05 | 6.3E-05 |
| BENZO(A)ANTHRACENE | NC | 4.4E-08 | NC | NC | 4.4E-08 |
| BENZO(A)PYRENE | NC | 3.3E-07 | NC | NC | 3.3E-07 |
| BENZO(B)FLUORANTHENE | NC | 4.4E-08 | NC | NC | 4.4E-08 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 4.7E-08 | NC | 4.7E-08 |
| DIBENZ(A,H)ANTHRACENE | NC | 1.3E-07 | NC | NC | 1.3E-07 |
| MANGANESE | NC | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC | NC |
| TOTAL PCBs | NC | 1.9E-07 | NC | NC | 1.9E-07 |
| VANADIUM | NC | NC | NC | NC | NC |
| TOTAL | NC | 1.5E-06 | 4.7E-08 | 6.5E-05 | 6.6E-05 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - not calculated; not a COPC in this medium, not classified as a class A, B, or C carcinogen,
or no dose-response value available

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-36
 NONCARCINOGENIC ASSESSMENT - FUTURE RESIDENT
 RME - TOTAL
 TLF
 REMEDIAL INVESTIGATION
 NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Drinking Water | Total |
|----------------------------|-----------------|----------|------------------|-------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC | NC |
| ALUMINUM | 1.1E-01 | NC | NC | NC | 1.1E-01 |
| AMMONIA | NC | NC | NC | NC | NC |
| ANTIMONY | NC | 2.2E-02 | NC | NC | 2.2E-02 |
| ARSENIC | NC | 1.8E-02 | NC | 6.0E-01 | 6.2E-01 |
| BENZO(A)ANTHRACENE | NC | 7.1E-05 | NC | NC | 7.1E-05 |
| BENZO(A)PYRENE | NC | 5.4E-05 | NC | NC | 5.4E-05 |
| BENZO(B)FLUORANTHENE | NC | 7.1E-05 | NC | NC | 7.1E-05 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 1.8E-03 | NC | 1.8E-03 |
| DIBENZ(A,H)ANTHRACENE | NC | 2.1E-05 | NC | NC | 2.1E-05 |
| MANGANESE | NC | NC | 1.7E-02 | NC | 1.7E-02 |
| THALLIUM | NC | 4.4E-02 | NC | NC | 4.4E-02 |
| TOTAL PCBs | NC | 5.1E-02 | NC | NC | 5.1E-02 |
| VANADIUM | NC | 1.4E-02 | NC | NC | 1.4E-02 |
| TOTAL | 0.11 | 0.15 | 0.019 | 0.60 | 0.88 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - Not calculated; not a COPC in this medium or no dose-response value available.

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

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TABLE 6-39
CARCINOGENIC ASSESSMENT - RECREATIONAL CHILD (1-6)
RME - TOTAL
TLF
REMEDIAL INVESTIGATION
NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|-----------------|----------|------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | NC | NC | NC | NC |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | NC | NC | NC |
| ARSENIC | NC | 7.1E-07 | NC | 7.1E-07 |
| BENZO(A)ANTHRACENE | NC | 3.9E-08 | NC | 3.9E-08 |
| BENZO(A)PYRENE | NC | 3.0E-07 | NC | 3.0E-07 |
| BENZO(B)FLUORANTHENE | NC | 4.0E-08 | NC | 4.0E-08 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 4.2E-08 | 4.2E-08 |
| DIBENZ(A,H)ANTHRACENE | NC | 1.2E-07 | NC | 1.2E-07 |
| MANGANESE | NC | NC | NC | NC |
| THALLIUM | NC | NC | NC | NC |
| TOTAL PCBs | NC | 1.7E-07 | NC | 1.7E-07 |
| VANADIUM | NC | NC | NC | NC |
| TOTAL | NC | 1.4E-06 | 4.2E-08 | 1.4E-06 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - not calculated; not a COPC in this medium, not classified as a class A, B, or C carcinogen,
or no dose-response value available

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

20-May-02

TABLE 6-40
 NONCARCINOGENIC ASSESSMENT - RECREATIONAL CHILD (1-6)
 RME - TOTAL
 TLF
 REMEDIAL INVESTIGATION
 NAS SOUTH WEYMOUTH, MA

| Chemical | Surface Soil | Sediment | Surface Water | Total |
|----------------------------|-----------------|----------|------------------|---------|
| 1,4-DIOXANE | NC | NC | NC | NC |
| ALUMINUM | 1.05E-01 | NC | NC | 1.0E-01 |
| AMMONIA | NC | NC | NC | NC |
| ANTIMONY | NC | 2.2E-02 | NC | 2.2E-02 |
| ARSENIC | NC | 1.8E-02 | NC | 1.8E-02 |
| BENZO(A)ANTHRACENE | NC | 7.1E-05 | NC | 7.1E-05 |
| BENZO(A)PYRENE | NC | 5.4E-05 | NC | 5.4E-05 |
| BENZO(B)FLUORANTHENE | NC | 7.1E-05 | NC | 7.1E-05 |
| BIS(2-ETHYLHEXYL)PHTHALATE | NC | NC | 1.8E-03 | 1.8E-03 |
| DIBENZ(A,H)ANTHRACENE | NC | 2.1E-05 | NC | 2.1E-05 |
| MANGANESE | NC | NC | 1.7E-02 | 1.7E-02 |
| THALLIUM | NC | 4.4E-02 | NC | 4.4E-02 |
| TOTAL PCBs | NC | 5.1E-02 | NC | 5.1E-02 |
| VANADIUM | NC | 1.4E-02 | NC | 1.4E-02 |
| TOTAL | 0.10 | 0.15 | 0.019 | 0.27 |

NOTES:

TLF - Tile Leach Field

COPC - chemical of potential concern

NC - Not calculated; not a COPC in this medium or no dose-response value available.

PCBs - polychlorinated biphenyls

RME - reasonable maximum exposure

20-May-02

**Record of Decision
Naval Air Station South Weymouth, Massachusetts
Appendices**

APPENDIX G – “MASSACHUSETTS BACKGROUND LEVELS OF POLYCYCLIC AROMATIC HYDROCARBONS AND METALS IN SOIL” AND A COMPARISON OF NAS SOUTH WEYMOUTH BACKGROUND CONCENTRATIONS TO STATEWIDE VALUES



Massachusetts
Department
of
ENVIRONMENTAL
PROTECTION

technical update

Background Levels of Polycyclic Aromatic Hydrocarbons and Metals in Soil

Updates: Section 2.3 *Guidance for Disposal Site Risk Characterization – In Support of the Massachusetts Contingency Plan (1992)*

Discussion

Polycyclic Aromatic Hydrocarbons ("PAHs") are ubiquitous and consistently present in the environment and are typically formed during the incomplete burning of organic material including wood, coal, oil, gasoline and garbage. PAHs are also found in crude oil, coal tar, creosote and asphalt. Historically, PAHs have been associated with human activities such as cooking, heating homes and industries and fuel for operating automobiles, although low levels of PAHs are also present in the environment from natural sources, such as forest fires. Their presence in the environment at higher concentrations is an artifact of habitation and is due to the widespread practice of emptying fireplaces, stoves, boilers, garbage, etc. in rural and urban areas over the past several hundred years. As a result, it is very common to detect "background" levels of PAHs in soils. Metals are both naturally occurring and found in man-made materials (such as paint, fuel, fertilizers and pesticides) widely distributed in the environment. Naturally occurring metals present in wood and coal are often found concentrated in ash residue.

DEP has obtained background data from various sources documenting the concentrations of PAHs and metals in soil affected by human activities, particularly soil associated with wood ash and coal ash. These levels are representative of typical concentrations found in areas with fill material, *not* pristine conditions. DEP has also compiled background soil data for metals that are representative of undisturbed, natural conditions.

The identification of generic values for PAHs and metals in soil is intended to streamline the risk characterization process (310 CMR 40.0900) and determination of applicable Response Action Outcome Category (310 CMR 40.1000). Nothing in this Technical Update obviates the need to establish location-specific background conditions for other purposes, such as compliance with the anti-degradation provisions of the Massachusetts Contingency Plan ("MCP") described at 310 CMR 40.0032(3).

Definition of Background (310 CMR 40.0006)

Background means those levels of oil and hazardous material that would exist in the absence of the disposal site of concern which are either:

- (a) ubiquitous and consistently present in the environment at and in the vicinity of the disposal site of concern; and attributable to geologic or ecological conditions, or atmospheric deposition of industrial process or engine emissions;
- (b) attributable to coal ash or wood ash associated with fill material;
- (c) releases to groundwater from a public water supply system; or
- (d) petroleum residues that are incidental to the normal operation of motor vehicles.

Basis of the Background Levels for Soil

The background levels were selected following an analysis of several datasets, including:

Data (30-140 samples) collected to represent background at c.21E sites located in non-urban areas, gathered from a review of DEP files.

Site-specific background samples generated for locations in Worcester (68 samples) and Watertown (17 samples).

Data (750-1,000 samples) collected by Mass Highway Department as part of the Central Artery/Tunnel (CA/T) project and presented in a draft document Background Soil Contaminant Assessment (CDM, April 1996).

Data (590 natural soil samples from depths of 10 to 70 feet) collected by Haley & Aldrich, Inc. in the Boston Area

Preliminary data compiled by the Massachusetts Licensed Site professional Association from background data submitted by its members,

Published data (62 samples) from ENSR, Inc. from 3 New England locations, and

Generic background data published by the Agency for Toxic Substances and Disease Registry (ATSDR).

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There is not one concentration of a chemical, of course, which can correctly be labeled *the* background level. Hundreds of years of human activities have only broadened the naturally occurring range of concentrations reported as "background", and this range is best thought of as a statistical distribution. In the evaluation of environmental contamination, we often select point values from the range of background levels, and consider these to be representative of background. The use of such point-value "background" levels is essentially a short-cut method that allows consideration of background in the absence of site-specific information. The intent of DEP policy is to protect public health while minimizing the routine site-specific determinations at sites in the statewide cleanup program.

"Natural" Soil

- Generally, the 90th percentile value from the MA DEP 1995 dataset was the point-value identified as background.
- In the absence of data in the MA DEP 1995 dataset, a lower percentile value from the CDM 1996 dataset was chosen as background.

Soil Containing Fill Material

- Generally, the 90th percentile value from the CDM 1996 dataset was point-value identified as background.
- In the absence of data in the CDM 1996 dataset, the 90th percentile value from the "natural" soil (MA DEP, 1995) dataset was chosen as background.

Applicability of the Values Listed in Table 1

Table 1 presents two lists of background concentrations: one for use with natural soils, and the second for use with soils containing either coal ash or wood ash associated with fill material, or other material consistent with the regulatory definition of background. The list for use with natural soils may be compared to site soil concentrations with no site-specific justification. The use of the list for soil containing fill material must be accompanied by documentation that the soil at the site does, in fact, contain coal ash or wood ash associated with fill material (or other material consistent with the regulatory definition of background). Such documentation may include information about the site history, soil strata, physical evidence or visual observations (including microscopic).

Elevated chemical concentrations and/or and urban setting are not, *per se*, sufficient evidence to justify use of the higher background levels.

Comparison of Site Concentrations to the Background Levels for Soil

Section 2.3 of the DEP's *Guidance for Disposal Site Risk Characterization -- In Support of the Massachusetts Contingency Plan* (1995) describes the use of DEP-published generic background values. If the site investigation indicates the presence of fill material in the soil, and all reported concentrations of an oil or hazardous material ("OHM") fall below the applicable value published in Table 1, then it may be concluded that the OHM is present at background concentrations. In other words, the values published in Table 1 are to be compared to the maximum reported concentration at the site. This Technical Update does not modify or change this comparison.

Table 1 lists background levels for "natural" soil and for soil containing coal ash and wood ash associated with fill material. A detailed summary of the data is attached in Appendix A. The applicability of these background concentrations to a site should be determined based upon the presence or absence of fill material containing coal ash or wood ash. If all contaminant concentrations are found to be equal to or less than the applicable background concentrations, a Class A-1 Response Action Outcome may be an option at the site, and no Activity and Use Limitation is required.

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Background Concentrations Different Than The MADEP-Published Values

Appendix A describes the wide ranges seen in the distributions of background concentrations. MADEP's choice of point values within these ranges balances the need to eliminate background chemicals from the risk assessment with the need to retain for evaluation those chemicals whose presence is related to the disposal practices at the site.

It is inevitable that at some sites the use of the values listed in Table 1 will incorrectly require the assessment of some "true" background concentrations of OHM at the high end of the background range. Conversely, some chemicals that *are* related to the disposal practices at a site (and are not background) will be screened out of the risk assessment by the use of the Table 1 concentrations. The goal is to minimize **both** kinds of error.

In many cases, additional information about the location of the site, the nature of the soils or the known or suspected disposal practices may be used to justify the application of different literature values or site-specific background information. DEP's adoption of the generic, statewide values presented in this Technical Update does not negate the validity of site-specific background information, when such information is available and of appropriate data quality. The level of effort necessary for such a justification will depend on the specific circumstances. For example, such a justification would be straightforward for elevated arsenic concentrations in soil at a gasoline-release site in an area of the state known to have geological formations rich in arsenic. The level of effort would be significantly higher at a tannery site in the same area due to the facility's historic use of arsenic. Similarly, the presence of elevated chromium or barium concentrations in marine clay deposits could generally be attributable to natural background absent known or suspected sources of the chemical at the site.

Minimizing Exposure to Soils Containing Elevated Background Material and/or Material Exempt from M.G.L. c.21E

As discussed in this Technical Update, M.G.L. Chapter 21E and the Massachusetts Contingency Plan (the statute and regulations) do not require remediation of chemicals present at levels consistent with background, even if such concentrations would otherwise pose a significant risk of harm to health, safety, public welfare or the environment. The statute also exempts several other environmental conditions (such as lead from lead paint or gasoline and pesticides applied according to their label) that could pose a Significant Risk.

While such conditions are not subject to regulation by DEP, the Department encourages parties to mitigate potential exposures whenever possible. Such mitigation measures could include:

- providing clean soil (down to a depth of 3 feet) in residential settings, and
- providing clean corridors for utility lines.

For Further Information

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Table 1.
MADEP Identified Background Levels in Soil

| | Concentration in "Natural" Soil | Concentration in Soil Containing Coal Ash or Wood Ash Associated With Fill Material |
|-------------------------------------|---------------------------------------|---|
| | mg/kg | mg/kg |
| OIL OR HAZARDOUS MATERIAL | | |
| ACENAPHTHENE ² | 0.5 | 2 |
| ACENAPHTHYLENE ² | 0.5 | 1 |
| ANTHRACENE ² | 1 | 4 |
| ALUMINUM ¹ | 10,000 | 10,000 |
| ANTIMONY | 1 | 7 |
| ARSENIC | 20 | 20 |
| BARIUM ¹ | 50 | 50 |
| BENZO(a)ANTHRACENE ² | 2 | 9 |
| BENZO(a)PYRENE ² | 2 | 7 |
| BENZO(b)FLUORANTHENE ² | 2 | 8 |
| BENZO(g,h,i)PERYLENE ² | 1 | 3 |
| BENZO(k)FLUORANTHENE ² | 1 | 4 |
| BERYLLIUM | 0.4 | 0.9 |
| CADMIUM | 2 | 3 |
| CHROMIUM (TOTAL) | 30 | 40 |
| CHROMIUM(III) | 30 | 40 |
| CHROMIUM(VI) | 30 | 40 |
| CHRYSENE ² | 2 | 7 |
| COBALT ¹ | 4 | 4 |
| COPPER | 40 | 200 |
| DIBENZO(a,h)ANTHRACENE ² | 0.5 | 1 |
| FLUORANTHENE ² | 4 | 10 |
| FLUORENE ² | 1 | 2 |
| INDENO(1,2,3-cd)PYRENE ² | 1 | 3 |
| IRON ¹ | 20,000 | 20,000 |
| LEAD | 100 | 600 |
| MAGNESIUM ¹ | 5,000 | 5,000 |
| MANGANESE ¹ | 300 | 300 |
| MERCURY | 0.3 | 1 |
| METHYLNAPHTHALENE, 2- ² | 0.5 | 1 |
| NAPHTHALENE ² | 0.5 | 1 |
| NICKEL | 20 | 30 |
| PHENANTHRENE ² | 3 | 20 |
| PYRENE ² | 4 | 20 |
| SELENIUM | 0.5 | 1 |
| SILVER | 0.6 | 5 |
| THALLIUM | 0.6 | 5 |
| VANADIUM ¹ | 30 | 30 |
| ZINC | 100 | 300 |

(Values rounded to one significant figure.)

¹ In the absence of fill-specific data, the "natural" soil value has been adopted.

² In the absence of data specific to "natural" soil, a lower percentile value from the fill data set has been adopted.



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Levels of PAHs and Metals in Soil from Various Datasets

Appendix A - Detailed Data Summary

| | | Geometric Mean | | ----- PERCENTILES -----> | | | | |
|----------------------------|---------------------|-------------------|-----------------|--------------------------|------------|------------|------------|---------------|
| | | Number of Samples | or Median mg/kg | Minimum mg/kg | 50th mg/kg | 90th mg/kg | 95th mg/kg | Maximum mg/kg |
| Total PAHs | | | | | | | | |
| | CA/T Project | 873 | 2.7 | 0.08 | 2.6 | 92 | 230 | 3000 |
| | ENSR - Urban Soils | 62 | 10.97 | 2.292 | | | | 167 |
| Total Carcinogenic PAHs | | | | | | | | |
| | CA/T Project | 873 | 1.5 | 0.022 | 1.1 | 42 | 95 | 1200 |
| | ENSR - Urban Soils | 62 | 4.86 | 0.68 | | | | 78 |
| Total Noncarcinogenic PAHs | | | | | | | | |
| | CA/T Project | 873 | 1.9 | 0.08 | 1.6 | 54 | 140 | 1900 |
| | ENSR - Urban Soils | 62 | 6.11 | 1.612 | | | | 89 |
| Acenaphthene | | | | | | | | |
| | CA/T Project | 868 | 0.18 | 0.024 | 0.18 | 1.9 | 4.1 | 42 |
| | Med City/Mill Brook | 67 | NC | ND (64) | NC | NC | NC | 1.7 |
| | ENSR - Urban Soils | 62 | 0.128 | ND (32) | | | | 3.4 |
| Acenaphthylene | | | | | | | | |
| | CA/T Project | 869 | 0.17 | 0.037 | 0.17 | 1 | 1.9 | 10 |
| | Med City/Mill Brook | 67 | NC | ND (65) | NC | NC | NC | 0.76 |
| | ENSR - Urban Soils | 62 | 0.133 | ND (38) | | | | 1.1 |
| Anthracene | | | | | | | | |
| | CA/T Project | 872 | 0.2 | 0.033 | 0.2 | 3.8 | 10 | 130 |
| | Med City/Mill Brook | 68 | NC | ND (52) | NC | 0.592 | 1.2 | 3.4 |
| | ENSR - Urban Soils | 62 | 0.184 | ND (8) | | | | 5.7 |
| Benzo[a]pyrene | | | | | | | | |
| | CA/T Project | 873 | 0.3 | 0.031 | 0.3 | 7.4 | 17 | 230 |
| | LSPA Project | 489 | 0.44 | ND (220) | 0.44 | 15.3 | NC | 222 |
| | Watertown | 17 | 0.95 | 0.6 | NC | 3.39 | 4.77 | 6.08 |
| | Med City/Mill Brook | 67 | NC | ND (43) | NC | 2.02 | 3.3 | 9.7 |
| | ENSR - Urban Soils | 62 | 0.686 | ND (5) | | | | 13 |
| | ATSDR Range: | | | 0.165 | | | | 0.22 |
| Benzo[a]anthracene | | | | | | | | |
| | CA/T Project | 872 | 0.33 | 0.045 | 0.33 | 8.5 | 19 | 250 |
| | LSPA Project | 490 | 0.563 | ND (206) | 0.563 | 17.6 | NC | 796 |
| | Watertown | 17 | 0.411 | 0.021 | 0.48 | 2.52 | 6.04 | 6.05 |
| | Med City/Mill Brook | 68 | NC | ND (38) | NC | 2.39 | 3.8 | 15 |
| | ENSR - Urban Soils | 62 | 0.672 | ND (4) | | | | 15 |
| | ATSDR Range: | | | 0.169 | | | | 59 |
| Benzo[b]fluoranthene | | | | | | | | |
| | CA/T Project | 873 | 0.68 | 0.045 | 0.4 | 8.4 | 18 | 270 |
| | LSPA Project | 486 | NC | ND (258) | NC | 11 | NC | 250 |
| | Watertown | 17 | 1.4 | 0.6 | 0.6 | 6.78 | 6.79 | 7.08 |
| | ENSR - Urban Soil | 62 | 0.722 | ND (7) | | | | 12 |
| | ATSDR Range: | | | 15 | | | | 62 |

Levels of PAHs and Metals in Soil from Various Datasets

Appendix A - Detailed Data Summary

| | | Number of Samples | Geometric | | PERCENTILES | | | |
|------------------------|---------------------|----------------------|--------------------|----------|-------------|-------|-------|---------|
| | | | Mean | Minimum | 50th | 90th | 95th | Maximum |
| | | | or Median mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Benzo[g,h,i]perylene | | | | | | | | |
| | CA/T Project | 871 | 0.2 | 0.045 | 0.2 | 3.1 | 7.7 | 17 |
| | Med City/Mill Brook | 67 | NC | ND (52) | NC | 1.2 | 1.41 | 5.2 |
| | ENSR - Urban Soil | 62 | 0.461 | ND (26) | | | | 5.9 |
| | ATSDR Range: | | | 0.9 | | | | 47 |
| Benzo[k]fluoranthene | | | | | | | | |
| | CA/T Project | 869 | 0.21 | 0.045 | 0.21 | 4 | 9.7 | 150 |
| | LSPA Project | 475 | NC | ND (289) | NC | 11.4 | NC | 110 |
| | Watertown | 17 | 0.502 | 0.065 | 0.406 | 3.35 | 4.47 | 5.13 |
| | ENSR - Urban Soil | 62 | 0.834 | ND (3) | | | | 25 |
| | ATSDR Range: | | | 0.3 | | | | 26 |
| Chrysene | | | | | | | | |
| | CA/T Project | 873 | 0.35 | 0.022 | 0.35 | 7.3 | 18 | 240 |
| | LSPA Project | 490 | 0.59 | ND (204) | 0.59 | 20.3 | NC | 420 |
| | Watertown | 17 | 0.32 | 0.016 | 0.404 | 4.55 | 5.06 | 6.6 |
| | Med City/Mill Brook | 68 | NC | ND (42) | NC | 2.1 | 3.6 | 14 |
| | ENSR - Urban Soil | 62 | 0.844 | ND (2) | | | | 21 |
| | ATSDR Range: | | | 0.251 | | | | 0.64 |
| Dibenzo[a,h]anthracene | | | | | | | | |
| | CA/T Project | 866 | 0.17 | 0.045 | 0.17 | 1.1 | 2.1 | 39 |
| | Watertown | 17 | 0.195 | 0.155 | NC | 0.494 | 0.604 | 0.64 |
| | Med City/Mill Brook | 68 | NC | ND (65) | NC | NC | NC | 1.6 |
| | ENSR - Urban Soils | 62 | 0.245 | ND (30) | | | | 2.9 |
| Fluoranthene | | | | | | | | |
| | CA/T Project | 873 | 0.89 | 0.035 | 0.61 | 14 | 33 | 490 |
| | Med City/Mill Brook | 68 | NC | ND (32) | 0.376 | 4.2 | 11 | 40 |
| | ENSR - Urban Soils | 62 | 1.38 | ND (2) | | | | 39 |
| | ATSDR Range: | | | 0.2 | | | | 166 |
| Fluorene | | | | | | | | |
| | CA/T Project | 873 | 0.18 | 0.028 | 0.18 | 2.3 | 5.5 | 79 |
| | Med City/Mill Brook | 68 | NC | ND (65) | NC | NC | NC | 2 |
| | ENSR - Urban Soils | 62 | 0.141 | ND (27) | | | | 3.3 |
| Indeno[1,2,3-cd]pyrene | | | | | | | | |
| | CA/T Project | 871 | 0.2 | 0.022 | 0.2 | 2.8 | 7 | 100 |
| | LSPA Project | 475 | NC | ND (304) | NC | 6.3 | NC | 130 |
| | Watertown | 17 | 1.752 | 1.2 | NC | 5.64 | 6.2 | 7.2 |
| | Med City/Mill Brook | 68 | NC | ND (50) | NC | 1.5 | 2 | 6 |
| | ENSR - Urban Soil | 62 | 0.532 | ND (19) | | | | 6 |
| | ATSDR Range: | | | 8 | | | | 61 |
| 2-Methylnaphthalene | | | | | | | | |
| | CA/T Project | 789 | 0.15 | 0.03 | 0.15 | 0.96 | 2.2 | 13 |
| | Med City/Mill Brook | 68 | | ND (67) | NC | NC | NC | 0.77 |
| | ENSR - Urban Soil | 62 | 0.121 | ND (43) | | | | 0.64 |

Levels of PAHs and Metals in Soil from Various Datasets

Appendix A - Detailed Data Summary

| | | Geometric | | <----- PERCENTILES -----> | | | | |
|--------------|---------------------|-----------|-----------|---------------------------|-------|-------|-------|---------|
| | | Number of | Mean | | | | | |
| | | Samples | or Median | Minimum | 50th | 90th | 95th | Maximum |
| | | | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg | mg/kg |
| Naphthalene | CA/T Project | 867 | 0.17 | 0.016 | 0.17 | 1.4 | 3 | 28 |
| | Med City/Mill Brook | 68 | NC | ND (65) | NC | NC | NC | 1.9 |
| | ENSR - Urban Soils | 62 | 0.0917 | ND (27) | | | | 0.66 |
| Phenanthrene | CA/T Project | 873 | 0.8 | 0.029 | 0.47 | 15 | 38 | 480 |
| | Med City/Mill Brook | 68 | NC | ND (38) | NC | 2.7 | 5.6 | 16 |
| | ENSR - Urban Soils | 62 | 0.788 | ND (1) | | | | 36 |
| Pyrene | CA/T Project | 873 | 0.89 | 0.034 | 0.61 | 16 | 35 | 440 |
| | Med City/Mill Brook | 68 | NC | ND (32) | 0.343 | 4.29 | 9 | 30 |
| | ENSR - Urban Soil | 62 | 1.54 | ND (1) | | | | 11 |
| | ATSDR Range: | | | 0.145 | | | | 147 |
| | | | | | | | | |
| Aluminum | DEP 1995 | 30 | 5536 | 387 | 7800 | 13000 | 16000 | 24000 |
| Antimony | DEP 1995 | 90 | 0.2 | ND (0.002) | 0.34 | 1.4 | 4.8 | 22 |
| | CA/T Project | 746 | NC | 0.25 | 1 | 7 | 12 | 160 |
| Arsenic | DEP 1995 | 139 | 4.7 | ND (0.1) | 4.8 | 16.7 | 24.5 | 99 |
| | CA/T Project | 754 | 5.3 | 0.25 | 5.4 | 14 | 21 | 99 |
| | H&A 2001 | 589 | 5.5 | ND | 5.57 | 11 | 12.9 | 23 |
| Barium | DEP 1995 | 64 | 15 | 0.42 | 15.7 | 45.2 | 52.8 | 104 |
| | H&A 2001 | 490 | 35 | ND | 35.7 | 80.9 | 89.3 | 680 |
| Beryllium | DEP 1995 | 103 | 0.21 | 0.03 | 0.23 | 0.39 | 0.53 | 1.6 |
| | CA/T Project | 746 | 0.5 | 0.03 | 0.5 | 0.88 | 2 | 7.5 |
| | H&A 2001 | 22 | 0.5 | ND | 0.63 | 1.15 | 1.2 | 1.3 |
| Cadmium | DEP 1995 | 127 | 0.43 | ND (0.01) | 0.29 | 2.06 | 3.4 | 5.9 |
| | CA/T Project | 756 | 0.5 | 0.1 | 0.5 | 3 | 5 | 25 |
| | H&A 2001 | 572 | 1.8 | ND | 1.26 | 1.63 | 1.63 | 3 |
| Chromium | DEP 1995 | 147 | 10.3 | 0.02 | 10.6 | 28.6 | 38.8 | 105 |
| | CA/T Project | 756 | 13 | 1 | 15 | 39 | 50 | 530 |
| | H&A 2001 | 589 | 22 | ND | 22 | 43.9 | 49.6 | 94 |
| Cobalt | DEP 1995 | 10 | 0.8 | ND (0.5) | NC | 4.4 | 4.5 | 4.7 |
| Copper | DEP 1995 | 103 | 7.7 | ND (0.5) | 7.3 | 37.7 | 56.1 | 160 |
| | CA/T Project | 742 | 34 | 1 | 30 | 170 | 320 | 5300 |
| | H&A 2001 | 22 | 26 | 6 | 27 | 47.5 | 64.5 | 130 |

Levels of PAHs and Metals in Soil from Various Datasets

Appendix A - Detailed Data Summary

| | | Number of Samples | Geometric | | <----- PERCENTILES -----> | | | |
|-----------|--------------|----------------------|----------------------------|------------------|---------------------------|---------------|---------------|------------------|
| | | | Mean or Median mg/kg | Minimum mg/kg | 50th mg/kg | 90th mg/kg | 95th mg/kg | Maximum mg/kg |
| Iron | DEP 1995 | 30 | 6031 | 444 | 7200 | 17000 | 22500 | 50000 |
| Lead | DEP 1995 | 141 | 19.5 | 1 | 19.1 | 98.7 | 158 | 326 |
| | CA/T Project | 850 | 51 | 0.05 | 53 | 570 | 1100 | 11000 |
| | LSPA Project | 457 | 83 | ND (5) | 83 | 640 | NC | 10600 |
| | H&A 2001 | 583 | 15 | ND | 24.4 | 78.9 | 112 | 300 |
| Magnesium | DEP 1995 | 30 | 1028 | ND (250) | 1300 | 4900 | 6700 | 11000 |
| Manganese | DEP 1995 | 30 | 81.5 | ND (3) | 110 | 300 | 365 | 460 |
| Mercury | DEP 1995 | 107 | 0.043 | ND (0.0002) | 0.066 | 0.28 | 0.43 | 1.4 |
| | CA/T Project | 785 | 0.15 | 0.001 | 0.15 | 1.4 | 2.6 | 23 |
| | H&A 2001 | 583 | 0.2 | ND | 0.19 | 0.74 | 1.1 | 2.5 |
| Nickel | DEP 1995 | 103 | 4.6 | ND (0.5) | 5.1 | 16.6 | 22.7 | 48 |
| | CA/T Project | 740 | 14 | 1 | 14 | 31 | 41 | 220 |
| | H&A 2001 | 22 | 34.5 | 5 | 35 | 67.5 | 70 | 101 |
| Selenium | DEP 1995 | 93 | 0.1 | ND (0.0005) | 0.17 | 0.5 | 1 | 4.6 |
| | CA/T Project | 756 | 0.5 | 0.1 | 0.5 | 1 | 2.1 | 57 |
| | H&A 2001 | 426 | 0.84 | ND | 0.74 | 1.36 | 1.58 | 2.8 |
| Silver | DEP 1995 | 117 | 0.09 | ND (0.003) | 0.07 | 0.58 | 0.91 | 82 |
| | CA/T Project | 756 | 1 | 0.19 | 1 | 5 | 7.3 | 81 |
| | H&A 2001 | 335 | 0.64 | ND | NC | NC | NC | 0.64 |
| Thallium | DEP 1995 | 71 | 0.1 | ND (0.005) | NC | 0.6 | 1.65 | 5 |
| | CA/T Project | 734 | NC | 0.035 | 1 | 5 | 5 | 50 |
| Vanadium | DEP 1995 | 30 | 7.6 | ND (1) | 10.3 | 28.5 | 38.5 | 46.6 |
| Zinc | DEP 1995 | 112 | 29.3 | 3.52 | 27.7 | 116.4 | 131.2 | 190 |
| | CA/T Project | 746 | 84 | 5.8 | 73 | 340 | 590 | 5000 |
| | H&A 2001 | 22 | 67 | 15 | 58.5 | 103 | 106 | 120 |

Record of Decision
Naval Air Station South Weymouth
Appendices

APPENDIX G
Comparison of NAS South Weymouth Background Concentrations to Statewide Values

| Analyte | NAS SOWEY Maximum Background Values - Surface Soil | NAS SOWEY Maximum Background Values - Subsurface Soil | State Urban 90th Percentile Background Values | State Non- Urban 90th Percentile Background Values | Units |
|------------------------|---|--|--|--|-------|
| ALUMINUM | 10,900 | 11,500 | 13,000 | 13,000 | MG/KG |
| ANTIMONY | 1.7 | 3.65 | 7 | 1.4 | MG/KG |
| ARSENIC | 5.54 | 2.30 | 14 | 17 | MG/KG |
| BARIUM | 49.9 | 34.40 | 45 | 45 | MG/KG |
| BERYLLIUM | 0.33 | 0.55 | 0.88 | 0.4 | MG/KG |
| CADMIUM | 0.9 | 0.12 | 3 | 2 | MG/KG |
| CHROMIUM | 10 | 12.10 | 39 | 29 | MG/KG |
| COBALT | 4.5 | 5.30 | 4.4 | 4.4 | MG/KG |
| COPPER | 29.4 | 14.20 | 170 | 38 | MG/KG |
| IRON | 11,300 | 12,300 | 17,000 | 17,000 | MG/KG |
| LEAD | 412 | 12.60 | 570 | 99 | MG/KG |
| MAGNESIUM | 2,180 | 2,790 | 4,900 | 4,900 | MG/KG |
| MANGANESE | 279 | 795 | 300 | 300 | MG/KG |
| MERCURY | 0.49 | 0.11 | 1.4 | 0.3 | MG/KG |
| NICKEL | 17.2 | 7.00 | 31 | 17 | MG/KG |
| SELENIUM | 3 | 0.41 | 1 | 0.5 | MG/KG |
| SILVER | | 0.28 | 5.00 | 0.60 | MG/KG |
| THALLIUM | 1.8 | 0.22 | 5 | 0.6 | MG/KG |
| VANADIUM | 89.1 | 19.50 | 29 | 29 | MG/KG |
| ZINC | 86.4 | 30 | 340 | 116 | MG/KG |
| ACENAPHTHYLENE | 0.21 | NI | 0.5 | NA | MG/KG |
| ANTHRACENE | 0.17 | NI | 1 | NA | MG/KG |
| BENZO(A)ANTHRACENE | 0.81 | 0.60 | 2 | NA | MG/KG |
| BENZO(A)PYRENE | 1 | 0.02 | 1 | NA | MG/KG |
| BENZO(B)FLUORANTHENE | 0.77 | 0.81 | 2 | NA | MG/KG |
| BENZO(G,H,I)PERYLENE | 0.31 | 0.33 | 1 | NA | MG/KG |
| BENZO(K)FLUORANTHENE | 2.7 | 0.32 | 1 | NA | MG/KG |
| DIBENZ(A,H)ANTHRACENE | 0.096 | 0.00 | 0.5 | NA | MG/KG |
| FLUORANTHENE | 2.4 | 1.10 | 4 | NA | MG/KG |
| INDENO(1,2,3-CD)PYRENE | 0.175 | 0.39 | 1 | NA | MG/KG |
| PHENANTHRENE | 1.5 | 0.36 | 3 | NA | MG/KG |
| PYRENE | 1.5 | 1.00 | 4 | NA | MG/KG |

Highlighted analytes exceed urban and non-urban 90th percentile values
 urban numbers - May 1997 proposed changes to MADEP 1995
 non-urban numbers - MADEP 1995; Guidance for Disposal site risk characterization
 NA - Not available
 NI - Not included in NAS South Weymouth background data set



COMMONWEALTH OF MASSACHUSETTS
EXECUTIVE OFFICE OF ENVIRONMENTAL AFFAIRS
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KERRY HEALEY
Lieutenant Governor

STEPHEN R. PRITCHARD
Secretary

ROBERT W. GOLLEDGE, Jr.
Commissioner

April 27, 2006

Mr. Robert Varney, Administrator
Region 1
U.S. Environmental Protection Agency
1 Congress Street, Suite 1100
Boston, MA 02114-2023


Re: Record of Decision
Tile Leach Field Site
Former South Weymouth NAS
MassDEP RTN 3-2621


Dear Mr. Varney:

The Massachusetts Department of Environmental Protection (MassDEP) has reviewed *Record of Decision, Operable Unit 5, Tile Leach Field, Naval Air Station South Weymouth*, received electronically on March 24, 2006. The Record of Decision (ROD) summarizes the results from the remedial investigation and the results from a post-risk assessment groundwater sampling event conducted to assess the potential presence of the volatile organic compound 1,4-dioxane, and provides the Navy's rationale for selecting a No Action decision. Based on the results from the remedial investigation, which indicated that current conditions at the site do not pose a significant risk to human health or the environment, and the results from the post-risk assessment groundwater sampling event, which confirmed the site is not a source of 1,4-dioxane, MassDEP concurs with the No Action decision for the Tile Leach Field site.

If you have any questions or comments, please contact David Chaffin, Project Manager (617 348-4005), or Anne Malewicz, Federal Facilities Section Chief (617 292-5659).

Very truly yours,


Robert W. Golledge, Jr. Commissioner
Massachusetts Department of Environmental Protection

Mr. Robert Varney

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April 27, 2006

CC: D. Barney, USN-S. Weymouth
P. Marajh-Whittemore, USEPA
Executive Director, SSTDC
RAB Members
J. Felix, MassDEP-Boston